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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

ESTIMATION OF COSTS.

THE cost of building depends on so many factors that it would be unfair to charge the architect with any intention of increasing the expenditure. The locality, rate of wages, cost of materials, and accommodation are among the chief factors of expenditure. They cannot be easily altered, and they affect primarily the expenditure. The architect is responsible for style and expensive ornamentation which may add considerably to the cost, as he may be continually proposing alterations, better materials, and fittings. There are times when these may be done judiciously, and for the benefit of the building—when there can be no question about the desirability of any alteration or additions; on the other hand, these suggested modifications may give rise to some doubt on the part of the building owner or promoters, and then the profession have to face the unpleasant inference that the increased cost has been due to the architect. There is the painful implication that it is the architect's interest to increase the cost, as he is paid by a percentage upon the actual cost—a not by any means fair inference to draw. If it is the fact that the greater the cost the larger is the architect's remuneration, it does not follow that a professional adviser would so seriously impair his integrity and honour by increasing the cost of the building by a £10 note with this object in view; but there is the unfortunate inference drawn by the public and those of a low moral standard from the fact.

No doubt the system of architect's remuneration, as we have said, has been prejudicial to the employment of the architect on this ground, and for this very reason it is of the greatest importance that the profession should not by any action on their part encourage this view. We are sure no one of any position in the profession would countenance any suggestion of adding to the cost of a building unless there was real improvement to be made by it; nor, on the other hand, refrain from suggesting any means of saving cost if an easier and better mode of construction presented itself to his mind. Still there are men who lack this higher standard of action, who are inclined to look on the profession as a means of not only making a livelihood, but of getting rich also, and who look on every available source of profit-making as legitimate. They work in the building profession as a commercial business. To this class of practitioners our remarks chiefly apply. The competition system of tendering has led to many irregularities. The ordinary building owner imagines that the lowest tender is a gain, that he reaps the benefit of the rivalry between contending builders who are anxious to get the work; though as a matter of fact he only

gets his *quantum meruit* in the shape either of sound material or labour, or an inferior extra quantity of workmanship. Many have found by dearly-bought experience what a low tender means—scamped work, greater vigilance in superintending the work, extras, and constant bickering. As a matter of fact, treating the low tender as an honest bid, the owner only gets what he pays for, nothing more. So that if an architect advises the acceptance of a higher tender, he does so simply to protect his client, to avoid extras and scamping rather than to increase the cost of the building. The undercut tender is always paid for by inferior materials and workmanship. But it is difficult to convince the average client of the fact. He cannot shake off the idea that it is the architect's fault that the work costs more than he had anticipated. When he employs a builder to put a house or a shop up for him without professional aid, he gets probably a low tender; but he pays for it "through the nose" in other ways. The builder contracts to erect a building that will suit the owner, but does not guarantee it to be the best: he can put just what materials he likes into it, and cut down the labour to the cost. No doubt it is a cheap job in one sense, and a very dear one in another. The builder is master of the situation: he has no drawings or specification or conditions of contract to consider, so he can do the work at less cost than a contractor who executes a regular contract under an architect. In this connection the subject of quantities suggests a few reflections. We have heard it said over and over again that a bill of quantities adds to the cost—there is the quantity surveyor's commission to pay; the items are taken full for the purpose of adding to the cost, and the architect is often held responsible for the increased expenditure. There may be reason for these objections if the document has been imperfectly prepared: as, for instance, when the surveyor, to cover his ignorance of the architect's intentions, adds to the measurements, puts on more labour, and "loads" the items; but if prepared by a competent man under the architect's supervision, the contrary is the fact. Just so much material and labour are taken as are necessary, and the builder, instead of guessing, is on safe grounds, and is not likely to add a percentage or take the work full to allow for omissions, as he often does when he takes off his own quantities. The cause of wide tendering is largely due to allowances made for discrepancies, to full measurements which one or two tenderers may discover. The practice of some surveyors is to take the quantities full, to cover omissions and mistakes, in consequence of which the astute builders deduct a certain sum from their priced quantities, and are thereby able to undercut other firms. These are practices which can-

not be justified. But when the quantities are made the basis of the contract, as they should be, any little fullness of dimension is measured, and is balanced against omissions and extras, so that the owner pays only his fair share of the actual work. When correctly taken, there can be no excuse for random tenders, lumping items that are not known, adding a percentage for contingencies, and so on. The bill of quantities or a schedule of prices agreed to between the architect and builder is the only honest way of finding the cost of a building. As we have said often before, the architect, as agent for the employer, had better not be engaged in quantities for his own building. We have often heard it said that he increases the cost by having quantities prepared; that when he takes off his own he is interested in making it full. We do not think so. We believe builders prefer tendering when quantities are prepared, and are more likely to tender low when they know they are correct. But the connection of the architect with the financial arrangements is questionable, and if he takes off his own quantities there will always be unsatisfactory remarks made and inferences drawn. All questions relating to expenditure are likely to be misinterpreted in the wrong light. The architect who is really conscientious and desires to spend his client's money to the best advantage, and to give him the greatest value, is often regarded as extravagant and is placed in the same category as the man who has run up the cost of the work in extravagant decoration and appointments, just for the sake of enrolment. Of course, such a conclusion is extremely unfair and aggravating. It is very easy to spend several hundreds, or even thousands, of pounds on a building in the shape of extravagant material and ornament, without making it a penny the better, for the material and display may be thrown away where they are not wanted. It is this class of expenditure that it is well for the architect not to encourage. Hundreds of pounds thrown away on stone carving on the top of a façade where it is not seen, and will soon decay or become black with soot, or on an elaborate ceiling design which is unnecessarily redundant in detail, or making a room larger than it need have been, or in ordering elaborate woodwork and electric-light fittings where a plainer design would be more in keeping, are instances of what we mean. Men who do these things have a poor sense of proportion in values; they throw away large sums on marble shafts and exuberant carving where they are not wanted, while at the same time other parts of the structure are reduced to the barest walls and the roughest makeshifts tolerated, only worthy of a factory or shed. The misapplication and misplacement of decoration and costly fittings are responsible for the unnecessary cost of many of our large

public and private buildings. The client and the tradesmen employed are often to blame; but the architect's duty is to protest against needless and tasteless ornament. He should be resolute, as his too ready compliance may easily render him answerable for the expense and for extras. It is so easy to be persuaded to select a more expensive material than that specified, or a more ornamental design for a ceiling, wall lining, or a mosaic floor. The manufacturing firm is only doing business in recommending a better material or a richer design, which there is always a temptation to accept if the extra cost is not great. It is in this way that the expenditure is increased without any appreciable advantage to the design. The client is not sufficiently acquainted with the advantages of any such alteration or addition to offer any opposition, but implicitly relies on his professional adviser, so that the responsibility of extra cost falls ultimately on the architect. He is blamed for the increased cost. The professional man adds much to his responsibility by a readiness to suggest improvements, and to recommend his client to order extras. Once the contract is settled, and the drawings and specifications made, the architect should be very wary of making any alteration that he can possibly avoid after the work has commenced. Even the setting back of a building may entail extra labour for excavation and concrete, and an excuse for making other costly alterations. The temptation to raise the height of a story is sometimes strong; there is a good reason, perhaps, why a foot or two more would considerably improve the rooms, and add to the importance of the building, and if money was unlimited, the suggestion might be carried out with advantage; but when the cost has been fixed, the architect would be exceeding his duty to make such an alteration or to suggest it to his client, if it was not absolutely essential. Having decided upon the requirements and accommodation to be provided by a set of plans for a building to cost a certain amount which has been approved by a client, it is bad policy for the architect to begin to point out to his client how it can be improved or enlarged and embellished, or for him to acquiesce in all the client wishes to satisfy his passing whims and taste. We know by experience what such alterations and additions run up to, how the whole contract is jeopardised, and how it enables the contractor to run into "extras" for a variety of things to make the contract pay.

The instructions issued to architects who enter into competition are often vague and unsatisfactory. Frequently a sum is stated with the proviso that no design whose estimate exceeds by a certain percentage—often ten per cent.—the specified sum will be accepted: an absurd condition, inasmuch as if the design be the best on the whole, it should be selected. It is better to state the extreme limit, and ask each competitor to submit an estimate of the cost, and to give the cubic contents of his design, and how he has calculated the same, so that a fair comparison may be made. The rate per cubic foot cannot be fairly made the test unless certain rules are followed as to the measurement. Therefore every competitor should be required to show how he calculated his cubic feet, and the rate per foot. Whether the sum given is inclusive of fittings, heating and ventilation, fencing the site, &c., should be made quite clear by each competitor giving separate estimates for these. It is much safer to make the cubic contents relate exclusively to the building without the above appointments, and to state the extra cost of heating, ventilation, fittings, and decoration, and this is the plan that has been adopted in several competitions of late, including the instructions to competing architects drawn up by Mr. Aston Webb, R.A., for the Hammersmith New Central Library. Estimates for buildings are often ambiguous on

these points, or whether inclusive or exclusive of the cost of furnishing, decoration, heating, and ventilation. These items are considerable. The fittings of a town-hall and public offices, including those of the council chamber and magistrate's court, form a considerable percentage on the total cost. To take the furniture and fittings of an ordinary school, the cost is found to vary between 10s. and 12s. or more per scholar, or 4 per cent. on the cost of building. Heating a public building with boilers, pipes, and radiators may cost from £3 to £4 per 1,000c.ft., so that for a building like a public library estimated at £10,000 the cost would be at least £600, a considerable item to add to the estimate. The average client who knows little of building has the idea that the architect's estimate should include everything, all fittings, heating and ventilation; hence we have so many misunderstandings when the accounts are sent in, or when a large sum for what is looked upon as "extras" has to be paid. The Englishman has a strong feeling for knowing the whole cost, and he likes his tradesman or his professional man to give inclusive estimates. For certain kinds of building it would be desirable if the architect comprised within his estimate all the trades that are necessary to produce a complete building. These should include all fittings, lifts, hot-water apparatus and ventilation, electric lighting, and other installations; the difficulty of course is in the obtaining tenders for these things from the various trades or subcontractors. The subject of cost includes chiefly the methods of measurement and calculation which the architect is seldom very expert in. While he may have a good general knowledge of the rates per foot cube for several kinds of building, he is often deficient in regard to the special trades to which we have referred. For this purpose carefully selected data of the actual cost of such things, and the proportion or ratio they bear to the whole cost of the building, or the cost per head, per unit of floor space, or say the cost per 1,000c.ft., are desirable. Just as the architect should be able, roughly, to say what percentage of the total cost the work of any particular trade, say, that of the bricklayer and mason or the carpenter and joiner would be; he should be able to estimate approximately the cost of seating a hall or a church, of the desks and benches for a school, the heating and ventilation. This knowledge of the proportional value of distinct trades is more important now than formerly, as each trade is carried on by firms who have made it a special study. We know of few aids to this kind of estimation for special branches. The professional man ought to make himself acquainted with these helps to estimation that he may be able when necessary to give a complete idea of the expenditure. The chief aim of the profession in this matter should be to give to his client a straightforward idea of cost, so that he may not find the sum greatly exceeded. After providing for everything necessary in the building, he should not reopen the question with proposals to improve it by adding to the expenditure, as many architects are apt to do. The profession will find that their best and wisest policy is to carry out their buildings within their estimates as far as they can, and not to give occasion to the enemy to throw the often-repeated charge that the architect's building is always expensive, and the cost greatly in excess of the sum originally intended to be spent.

BUILDING BY-LAWS IN RURAL DISTRICTS.

THE efforts that have been made of late years to limit the official control of private buildings in rural districts are reasonable, and cannot fail to evoke attention.

Some time ago we commented favourably on the set of model by-laws for rural districts, which the Local Government Board issued, having this end in view. We pointed out how country houses, farm and agricultural buildings, and dwellings for the working classes were subjected to unnecessary by-laws, the actual need for which did not apply, however useful they might be in urban districts. We are glad to see that the question has not been allowed to drop. The Building By-Laws Reform Association has been formed to prevent any unnecessary interference with owners and others interested in rural buildings, and the letter of Mr. R. A. Read, the hon. sec. of the Association, we printed last week, will be read with interest by all building owners who desire to be freed from unnecessary official regulations. Of course it will be undesirable to provide a cut and dried set of by-laws for all rural districts, and the Board leave to the several districts in each case what by-laws, if any, they will propose to make, which will depend on the circumstances. In some districts, which are rapidly growing in extent and density, the by-laws will necessarily be more numerous and strict than would be required for a small rural area. The model by-laws issued in 1901 observed: "Portions of many rural districts are distinctly urban in character, and the development of building is constantly changing the aspect of the country, and it devolves on the rural district councils to endeavour to apply to the several parts of their districts such regulations as the circumstances may from time to time require." No one will doubt the desirability of such action. In one part where the buildings are sparse and simple, with large areas of land around them and thinly inhabited, the precautions necessary would be few, and only have reference to matters affecting health, such as the foundations and walls of new buildings, sufficiency of space about them to secure air-circulation, drainage, closets and ashpits, cesspools. In another part of the district which is assuming an urban character, where the buildings are closer together, it may be desirable to introduce clauses dealing with construction, the prevention of fire, and the level and width of new streets. According to the density of the populated areas, it will be necessary to legislate. In fact, each part of the district should select those clauses from the model series that are appropriate to the requirements of the district, or a portion of it. While regulations in the interest of public health are necessary, the by-laws and regulations in many districts go beyond these needs. The Reform Association, in its articles of constitution, while recognising the value of regulations on the above ground, is endeavouring to resist unreasonable encroachments upon the liberty of the individual, who is often unable to do anything by himself. The Association is turning its attention to the task of getting the old, unreasonable by-laws amended, in rural districts especially, and it points out that these oppressive by-laws are exercising an injurious influence upon the provision of dwellings for the working classes, and it is thought that, by removing unnecessary restrictions, an impetus will be given to the erection of new cottages so greatly needed in many districts. The amendment of by-laws in urban districts will also be considered by the Association. We believe many in the profession will join in the endeavour to secure more consistent measures. There are many districts of a rural character where very restrictive and oppressive clauses are in operation. We might mention several of the districts near our seaside resorts where by-laws are in force against hollow walls, half-timbered and stucco, or tile-hung gables, oversailing of all kinds, the erection of external features to small villas. We know there has been a great outcry about such interferences with private

property; architects and builders have complained of the restrictive regulations which many local authorities enforce under penalty, and the authorities would be aiding the development of their locality by obtaining amendment of these by-laws.

To refer in detail to some of the model by-laws issued by the Local Government Board. The prefixed memorandum states that rural district councils are not directly authorised to make by-laws, but can obtain power by adopting Part III. of the Act, 1890, under section 23, on certain subjects which are enumerated, and which refer mainly to structural matters which affect health, drainage, ventilation, air space about buildings, height of rooms, &c. Of the model series issued, by-law 2 exempts certain buildings from the by-laws. Special attention is drawn to subdivision (h), which runs as follows:—"Any building which shall not be a public building or a building of the warehouse class, and shall not be constructed or adapted to be used either wholly or partly for human habitation, or as a place of habitual employment for any person in any manufacturing trade or business, and which, if intended for use as a pigsty or a cowhouse, shall be detached from any dwelling-house." The effect of this clause is "practically to exclude from the operation of the by-laws all buildings which are not dwelling houses or used wholly or partly for human habitation, or as a place for the habitual employment of any person." Thus, agricultural buildings, out-buildings, plant-houses, summerhouses, poultry houses, tool houses are unrestricted, except that they should not encroach on the open space required for new domestic buildings. If not detached from a dwelling-house, even a pigsty and cowshed come within the operation of the law. Public buildings and warehouses are also included, though the provisions in respect of them are few. We have referred to the by-laws proposed: these briefly relate to a layer of cement concrete on site of every new building, dampcourses, walls impervious to moisture below the ground level, or double walls—all of which are structural requirements no one will object to.

Clauses 6 and 7 are perhaps more open to objection in country districts. These deal with the provision of a proper space about buildings to secure a free circulation of air. The by-law is framed to meet the case of houses fronting narrow roads, which in the country cannot possibly be avoided in many cases. It may be considered a vexatious rule that where a house is built facing a street less than 24ft. wide it should be made to set back to a distance of 12ft. from the centre of street. It is still more objectionable that no projection such as a gable or bay window is to encroach on the open space provided. By-law 7 seems almost unnecessary in open country districts where the house is built close to an open field or space. In urban districts it is desirable that every building should have in the rear an open space exclusively belonging to the building of at least 150sq.ft., and free from any erection except a closet or ashpit; but in the country the by-law may restrict many building operations, and the cottage builder might find it impossible in every case to obtain an area of that extent behind, although the cottages may abut on a large field or park. The other sub-clauses which regulate the width of open spaces according to the height of building seem almost, for the same reasons, unnecessary. Although by-laws 8 to 12, dealing with the ventilation of buildings, do not impose any restrictions on the position or shape of windows or fireplaces, they are likely to be used to restrict the architect's freedom of design. A troublesome surveyor or official may, for example, contend that the rooms of a new domestic building are insufficiently lighted, that "a sufficient number

of suitable windows in such a manner and in such a position" as described in by-law 8, has not been provided, or that they do not afford effectual means of ventilation. Clause 9 may be also quoted to prevent certain windows being introduced because of being a few inches less in area than one-tenth of the floor area of a room, or that one half of the window does not open. At least, we may imagine cases where the surveyor might make any of these requirements an excuse for not passing plans that were otherwise excellent in themselves. A technical objection might also be raised under by-law 10 in regard to a clear space of 3in. between the under side of every joist and the upper surface of the ground or concrete; a trifling half an inch less may be urged to warrant non-compliance. We think these by-laws 8 to 11 may be amended with advantage in the case of rural districts where there is ample light and air. The provision of a flue or air-shaft to every habitable room that has not a fireplace, equal in sectional area to 50 square inches or about 7in. square, imposes a condition that would be unnecessary in large rooms ventilated by the door and windows.

It is needless to enter into other parts of the by-laws referring to drainage. The drainage of the subsoil of a new building is essential to health, but for dry soils it is not necessary. Other by-laws relating to closets, ashpits, and cesspools are necessary in the interests of health, and we cannot take exception to them; but even these provisions ought to be modified to suit each district. Under by-law 43 the authorities will have ample opportunity of enforcing necessary conditions in buildings intended for human habitation, for it gives them power to close any building they think unfit for such purpose. Local authorities have the opportunities for drafting any by-laws that are specially necessary, and the procedure is pointed out. Any by-laws proposed must be submitted to the Board in the first instance in draft for their approval, and draft forms for this purpose are obtainable. Where building by-laws or regulations are in force, and give dissatisfaction, the local authorities are responsible, and they should endeavour to propose amendments with the object of simplifying them, so that the official regulation of private buildings may be limited to the demands of public health and safety. The Association we have mentioned assists authorities in such action, and also in the adoption of new by-laws that will not sacrifice the liberty of individual owners. The architectural profession are directly interested in such a measure of reform. Their hands are much tied by urban regulations, and official interference. In country districts, where they have hitherto been free from restrictions upon their designs, they naturally look for exemption from laws which have reference to a totally different set of conditions and surroundings.

WEIGHT-BEARING STRAIN OF THE CONYER STOCK BRICK.

MESSRS. EASTWOOD AND CO., LTD., of Belvedere-road, Lambeth, S.E., in their fresh issue of Press notices referring to their new system of brickmaking as carried on in their Kent brickfields, to which we lately drew special attention, invite particular notice to the important results of experiments made by David Kirkaldy and Son, at their testing and experimenting works, to ascertain the resistance to a gradually increased thrusting stress of six bricks, machine made and hand made, supplied by them. The tabular results must be examined by our own readers for the actual figures. Six of the stock bricks subjected to these tests were the special bricks made by the new process or machine, dried in dryer, and burnt in kiln; the other six bricks were ordinary hand made. The six hand-made stock bricks, which we take first, slightly varied in thickness, length, and width; but the mean base area was 37.39sq.in. The stress in pounds is given in

three columns, headed "Cracked Slightly," "Cracked Generally," and "Crushed." The highest results under the first head is 76,600lb., the lowest 44,120lb., while looking at the last or "Crushed" column 96,420lb. is given as the highest, and 52,260lb. as the lowest results. The mean stress in the first column is 57,236lb., and the mean of the latter 73,260lb., representing tons per square foot in each case as 98.3 and 125.9. The bricks were bedded between pieces of pine 3in. thick and the recess filled with cement. The results of the tests with the six stock bricks made by the new process and kiln burnt are remarkable evidences of the greater strength and cohesiveness of these bricks. Let us take the same figures from the table: the base area had a mean of 37.15sq.in., rather smaller than the former. Taking the "cracked slightly" we have for the highest result 93,600lb., the lowest 71,400lb. Under the "crushed" column 134,300lb. and 88,600lb. respectively, giving a mean of 85,067lb. for the former, and 112,433lb. in the "crushed" column, or in tons per square foot of 147.3 for "cracked slightly," and 194.7 for "crushed." The net result therefore is that the Conyer stock made by machine, dried in dryer and kiln-burnt, has a weight-bearing strain of 194.7 tons per square foot, and the ordinary hand-made stock 125.9 tons per square foot, giving the remarkable increase of 68.3 p.c. in the strength of the stock brick made by the new process. We think our practical readers will say this is a very important gain in crushing strength. The experiments to ascertain the porosity of three bricks of the improved make show a mean absorption of 7.83 per cent. These results are valuable additions to our tables of the strength and porosity of stock brick, and must be very gratifying to this company.

ON BUILDING TIMBERS.—XXIX.

RED PINE (P. RESINOSA) AND YELLOW PINE (P. STROBUS).

THE wholesale prices of First Quality red pine deals are 4in. and 6in. by 9in. and 11in., £14 15s. per Petersburg standard; 4in. by 9in. and 11in., £12 10s.; 4in. by 8in., £10 10s.; 4in. by 7in., £9 15s.; 3in. by 11in., £12 5s.; 3in. by 9in. and 10in., £16 15s.; 3in. by 10in., £16 10s.; 3in. by 9in., £12 10s. to £16 15s.; 3in. by 8in., £9 10s. to £13 15s.; 3in. by 7in., £8 15s. to £13 5s.; 3in. by 4in. and 4½in., £8 15s.; 2½in. by 9in., £15 15s.; 2in. by 7in. and 8in., £8 17s.; 1½in. by 11in., £16 15s. to £18; 1½in. by 10in., £14 10s.; 1½in. by 8in., £13; 1½in. by 7in., £12 15s.; 1in. by 11in., £16 5s.; 1in. by 10in., £13 15s.; 1in. by 9in., £15; 1in. by 8in., £12 10s.; 1in. by 7in., £12 15s. Second Quality, 3in. by 11in., are worth £11 15s.; 4in. by 9in., £10 5s.; 4in. by 11in., £10 15s. There are other qualities, known in the trade as "A," "B," and "C," 3in. by 11in. "A" quality are worth £9; 3in. by 9in., £10 5s.; and 1in. by 9in., £9 to £9 5s. Although the Quebec standard hundred is one of 100 deals 12ft. by 11in. by 2½in., all Canadian deals are sold in London by the Petersburg standard hundred of 120 deals 12ft. by 11in. by 1½in. The real London (and Dublin) standard hundred is one of 120 deals 12ft. by 9in. by 3in.; Christiania 120 deals 11ft. by 9in. by 1½in.; and the Dram hundred 120 deals 9ft. long by 6½in. by 2½in. Converted into cubic feet and "Board Measure," these are respectively Petersburg 165c.ft.—1,980B.M.; London and Dublin, 270c.ft.—3,240B.M.; Christiania, 103½c.ft.—1,237½B.M.; Dram, 121½c.ft.—1,462½B.M.; and Quebec, 229½c.ft.—2,750B.M. All building timber is squared up to Board Measure in America, the standard being 12in. by 12in. by 1in. or 1ft. square 1in. thick; hence the English cube foot is equivalent to 12ft. American "Board Measure." From the figures given above it will be seen that First Quality Red Pine varies in price according to condition, length, and other dimensions, from 2s. 0½d. per cube foot down to 1s. 1d.; Second Quality, from 1s. 5d. to about 1s. 3d. for boards; Third Quality, from 1s. 6d. to 1s., and unsorted from 1s. 2½d. to 11d. "A" quality is worth about 1s. 0½d. Canadian pine, red or yellow, is measured in log by some one of the following methods:—(1) The full contents without deduction of any kind for faults; (2) such logs only to be measured which are sound and fairly made, with gum seams closed at the butt, sound knots not to be noticed and lengths under "merchantable" standard if

they are not under 12ft. long, are to be included; or (3) the logs are to be selected (culled) and measured in a merchantable state, according to the inspection rules. In culling, "M" is merchantable timber, the letter being stamped in the end of the log; "U," sound and merchantable, but under merchantable size; "S," second quality, "T," third quality, and "R," rejected and unmerchantable. Square Red Pine timber must be free from rot, rotten knots (a rotten knot is one which is so decayed as to affect the surrounding wood), worm-holes, shakes, and splits; but sound knots are not objected to. Lathwood is cut in lengths from 3 to 6ft., free from rot; it must split freely, and each billet may contain three or four open case-knots so long as they line with each other, and the billet may have one twist in the length, but no more. Pine boards must be 10ft. in length and over, not less than 1in. thick or 7in. broad; they show an equal width from end to end, edged with a saw, and trimmed to a straight line: each board must be the same thickness from end to end, and all the boards shall be free from rot, bad knots, rents, and shakes. No board is rejected on account of the sawwood in it, whether it is blue or dried light in colour like heartwood. All red-pine deals to be merchantable (marked "I"), shall be free from rot, rotten knots, grub worm-holes, open case-knots, and splits. Small sound knots and heartshake will be allowed if the latter does not run far into the deal, or form a split through at the ends. They shall be free (or nearly so) from black or dead sap; but sound sap on the corners or on a portion of one face of a deal is not objected to. This description of a first quality red deal should interest the architect and surveyor, for it will be seen that a certain quantity of "black" sap may be present, and "second" sap is in no way objectionable. The distinction between the two kinds of sawwood is a subtle one, for though patent to the eye, still one is quite as objectionable as the other in any piece of wood exposed to the weather. It cannot be too strongly urged on clerks of works and building foremen that the colour of sawwood in no way affects its weathering qualities. Both sound sawwood and black sawwood have the same objectionable constituents, and these invariably lead to rapid decay of the wood in presence of moisture. Second quality, red pine deals (marked "II"), are those which are not up to the standard of "merchantable," and are better than "Culls" (marked "X"), the best deals not good enough to be seconds, and too good to be "Culls," are Third Quality (marked "III"). Deals of all these (fine) qualities shall not be less than 8ft. long, 7in. broad, and 2½in. thick; deal ends are not less than 6ft. long; the deals must be well sawn and squared on the ends with a saw, and colour alone does not in any way affect the quality of a deal. Red Pine logs are not less than 20ft. long by 10in. by 10in. in the middle, and 20ft. long and up, if 12in. by 12in. or more in the middle. Red Pine logs can taper 2in. in every 25ft., and have a curve or hollow of 3in. in 20ft. The rules provide that the culler shall have logs and deals properly chopped or dressed before they are certified as merchantable in every case where they are improperly hewn, squared, butted, or edged, even though they are merchantable in every other respect.

YELLOW PINE.

The timber known as "Yellow Pine" in England is the White Pine of the United States and Canada. It is called Weymouth Pine, Soft Pine, Northern Pine, and Spruce Pine, its botanical names being *Pinus Strobus* and *Pinus Pennsylvanica*. This pine is lucky in having fewer names, botanical and local, than any other pine found growing on the American Continent! This is the "Northern Pine," as the Pitch Pine is the "Southern Pine," and the individuality of the timber is so marked that it cannot possibly be mistaken for that of any other species, as the latter is frequently, and this is an immense advantage to the profession in general, for American architects specify "Southern Pine," and our architects specify "pitch pine," not knowing that the wood of five different trees can be supplied under these names, and all having the greatest range in qualities, for American architects will often specify "Georgia Pine," and then refuse to look at Texas or North Carolina pine, although the same wood and the same quality are included under all these names! Practical men, the knowing ones in the trade, deal in

Long-leaf Pine "from Arkansas," where the tree known by that name never grew, and men who have all their lives been engaged in sawing timber in the States execute their orders for Long-leaf Pine with either of the other varieties, overlooking the differences or being wholly ignorant of them. There are different kinds of sawn timber common in the trade of the United States called by specific names. Yet few people understand that they may all be derived from the same species of tree, and the same wood in every respect, but none of this confusion attends the use of what the Americans call "White Pine," for the wood is unmistakable wherever it is found, and no matter where it came from.

A number of closely-related pines, found in the United States, and others in Europe and Asia, have mild-working wood, similar to the well-known yellow pine; but none of these have as yet displaced that grown in the Northern States and in the Great Lake region of Canada. The white pine of the Rocky Mountains (*Pinus Flexilis*) is one of these; the sugar pine of the Pacific coast another (*Pinus Lambertiana*). Other "colourable imitations" of yellow pine are *P. Monticola*, *P. Albicanis*, *P. Stroboformis*, *P. Quadrifolia*, *P. Parryana*, and *P. Cembra*—all found in the States. The stone pine of Switzerland (*P. Cembra*) and the Bhotan pine of India (*P. Excelsa*) are all of the same species. All these trees have slender, delicate leaves, five in a sheath, and wood of even texture, the whole, no doubt, having descended from a common ancestor. The yellow pine has a small root development, generally near the surface, so that it depends less on the soil for its growth than the atmosphere; and when it is grown in the open, as it frequently is in England, there is a tendency to throw out branches, or "to fork," as it is called, near the ground, to protect the roots from intense cold in winter and undue evaporation in summer. The wood of Yellow Pine is softer, and has much less "hard grain" than either red pine or pitch pine: it is also of more uniform texture than any Baltic or White Sea wood. It has been explained in previous articles that the stem, bole, or trunk of a tree is made up of a number of annual rings, each of which consists of two kinds of wood, that portion deposited in the spring being open-celled and soft, and that deposited in the summer, which is narrow-celled and hard, the difference arising from bark pressure, which is least in spring and greatest in summer. Now in yellow pine the transition from spring to summer wood in the annual rings is so gradual as to be almost imperceptible, whilst in all other pines outside this family, especially in the pitch pines, the rings are of two woods of about equal widths, one soft and the other hard, the change from one wood to the other being abrupt, as if the bark, after having been loose on the trunk in spring, suddenly became rigid again in summer, thus allowing no opportunity for the formation of any wood intermediate between the two. Yellow pine has no equal for carving, furniture, and internal joinery, such as door-panels, mouldings, stairs, balusters, and other fittings, where the surface is to be painted, and where great width with an absence from knots is desirable. There is another peculiarity in yellow pine which makes it valuable to the joiner—viz., that in it the resin ducts are smaller and fewer than in the other pines—for instance, in comparing the *Pinus Strobus* with *Pinus Sylvestris* (Baltic redwood) the resin ducts in the bark of the former are to those in the heartwood as 28 to 27, whilst in the latter the proportion is 9 to 37; this makes the yellow pine a wood much easier to be worked than any variety of the other. For 250 years yellow pine has been used for building in the United States, and there it is used for everything of wood in houses from the cellar to the roof, the latter even being covered with it, cut into shingles. American architects adopt this wood as a special favourite on account of its lightness, stiffness, and durability. Yellow pine extends west from Newfoundland and the Atlantic Coast, its northern limit being an irregular line between 49° and 51° of latitude, its greatest northern extension occurring near its western limits. After passing along the south-eastern end of Lake Winnipeg, the boundary line turns southward, closely following the 95° meridian of longitude, skirting the boundary of Wisconsin and Iowa, crossing Northern Illinois; at the head of Lake Michigan, it continues east to the shores of Lake Erie, when it turns in a south-westerly direction along West Virginia and East Tennessee to North Georgia, its south-most limit,

when it turns back again to the Atlantic Coast at New Jersey. Yellow pine is therefore found in Newfoundland, New Brunswick, Nova Scotia, Southern Quebec, Ontario, and Eastern Manitoba, and in the States of Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, Vermont, New Jersey, New York, Michigan, Wisconsin, Minnesota, Pennsylvania, Western Maryland, West Virginia, East Tennessee, North-West Carolina, and North Georgia; in southern latitudes it is confined to the higher lands. Commercially valuable timber is not found over all this vast area: it is confined chiefly to New Brunswick, Nova Scotia, South-Western Quebec, and Ontario in Canada; and in the States to New York, Pennsylvania, and the northern parts of Minnesota, Wisconsin, and Michigan. In the higher latitudes the Canadian Yellow Pine becomes more and more intermixed with Spruce. There is no wood in the world of which there is a greater quantity used than of yellow pine, and the demand for it is so great that in a few years the existing pine forests will be completely cleared. Indeed, much of the capital invested formerly in the pine industry of the Lake regions has now been transferred to that of the Southern States, Long-leaf Pine attracting what has been withdrawn from Yellow Pine conversion. In Maine the great Northern Pine belt once covered the State, and many of the trees were so magnificently developed, especially in the river valleys, that they gave it the name of "the Pine Tree State." Some of these trees were from 6ft. to 7ft. in diameter and 250ft. high; but these forest giants have long since disappeared—in fact, the virgin trees in this State have been entirely removed. In New Hampshire and New York State the higher altitudes with poor soil, are now stocked with spruce and hardwoods, pines being very poorly developed; in the Adirondacks the Yellow Pine has almost disappeared, and the few specimens left, associate with maple, beech, birch, and spruce in the lower grounds on lake shores and water courses, where they may be seen towering to a height of 50ft. or 60ft. above the general level of all the other trees; indeed, the finest development of this timber is always found along river valleys. As the Yellow Pine extends southwards into the warmer States it is forced on to higher and higher ground, until in North Carolina the wood is of no value whatever for building, when it is found growing below the 2,000ft. contour line above the sea level. Yellow Pine is well developed in the basin of the St. Lawrence and around the Great Lakes, which makes its exportation and shipment economical: hence from parts on the St. Lawrence nearly all this timber is shipped to England, and Michigan, Wisconsin, and Minnesota are known as the great lumber region in the States. Pure pine forest is rare in Canada. North and west from the Ottawa River to Georgia Bay is about the most productive district for yellow pine, and here it is mixed with hardwood, hemlock, spruce, and arbor vitae. In Ontario the pines are scattered and mixed with hardwoods, as in Southern Michigan. Yellow Pine is indigenous to Newfoundland, and here it yields considerable quantities of valuable timber, along its north-western limits pine into prairie or spruce forest. It is estimated that the area of the true home of the Yellow Pine in Canada and the States cannot be less than 400,000 square miles, and over the whole of this it can be cultivated so as to be commercially successful. In the northern United States, as in Canada, the nature of the soil determines the kind of tree grown in it. Sandy soils are favourable to the growth of pines, and in a typical pine forest about half the trees will be yellow pine, less than one-half red pine, and the remainder hemlock. On sandy soils and gravels Red Pine generally displaces Yellow Pine, for the latter thrives best in a moist loamy sand overlying clays, though in places where stiff clay alone is found, sugar maple, birch, and beech displace the pines completely. In Michigan and Wisconsin climate does not affect the distribution of the pines as it does in Minnesota, Red and Yellow Pines, with Tamarack (*Larix laricina*), Arbor Vitae (Cedar, *Thuja Occidentalis*), and Spruce (*Picea Alba*), occupy the swamps and highlands which would be occupied by hardwood elsewhere. All the virgin pine has long since been cut out in Michigan, and the exploitation of the forests which first began in the 17th century by the erection of saw mills in connection with the numerous grist mills found all over the country.

was practically ended so far as the main bulk of the large timber was concerned long before the first steam sawmills were erected at Saginaw in 1834. Yellow Pine was exported from Canada by the first settlers, and to-day the trade done between Canada and the States alone, in pine and spruce logs and deals amount to about one and a half million feet Broad Measure, the whole of which comes from the upper waters of the Ottawa, the shores of Lake Huron (Georgian Bay district), and Lake Superior. About 95 per cent. of the yellow pine now on the market is found cut into lengths of from 12ft. to 18ft., three-fourths of the whole being 16ft., a length, for some reason, preferred in the trade to any other; these lengths are converted into dimension stuff 1in. to 4in and up wide, also into deals and boards, the widths always varying by an even number of inches. Slabs are cut into laths, and the thickest slabs, together with the second portions of defective logs are cut into shingles, in the manufacture of which "knot sawyers" carefully cut out all the knots and decayed wood. In breaking up a log, gang-saws cut it into slices of various thicknesses, and these are subsequently re-sawn by an "Edger," who rectifies the uneven edges, and cuts each one to a standard width. Any flitches in deals found free from knots is called "clean stuff," and others are kept in as large pieces as possible, being of much more value than if cut up into smaller scantlings. The clear stuff or "uppers" rarely forms more than 15 per cent. of the tree at present, all the large clear timber having been cut down and converted long since. The quantity of log timber brought to market is insignificant as compared with that converted into dimension stuff and deals. Dimension stuff is often resawn, after it has left the mill, by small dealers, who buy inferior qualities, and obtain from them flooring and boards of a better class than the stuff from which they are cut! Perfectly clear yellow pine of large dimensions may sell for 3s. per cube foot in the States, and the merchant may retail it at 6s. Such is the demand for it by model-makers and others, at a public sale in London in the early part of this year some dry yellow pine deals brought £32 per standard or about 3s. 6d. per cube foot. Several attempts have been made in the States to substitute other woods for yellow pine in the manufacture of sashes and doors, notably the Cypress (*Taxodium Distichum*) and the White Cedar (*Chamaecyparis Thuyoides*), but the growth of these trees is not extensive enough to warrant their being considered in any way likely to displace yellow pine.

In natural forests, where the trees are crowded together, one shading the other, *Pinus Strobus* grows with a straight trunk without branches for about half the distance between the ground and the top of the leader, but in open spaces it throws out branches within a few feet of the ground; its rate of growth, both in height and diameter, is entirely determined by the size of the crown and the conditions of light to which it may be exposed. The rate of growth in height is rapid after the fifth year, when, up to the tenth year it attains its maximum of 16in. (per annum), this declines gradually up to one hundred, when the rate of growth is reduced to from 6in. to 7in. After 160, when it is only 2in., the growth in height may be said to have ceased, though in some few specimens the leaders have reached 200ft. from the ground. Good merchantable timber can only be obtained from trees 30 or 40 inches in diameter, and these would take 200 years to grow to this size, hence the entire destruction of the pine forest can only be a question of a very few years. The average rates of growth, taking 224 trees, were found to be as follows:—At 50 years, 8.7in. in diameter, 56.7ft. high; 100 years, 17.2in. in diameter, 91.3ft. high; at 150 years, 25in. in diameter, 114.4ft. high; and at 200 years, 31in. in diameter and 129ft. high. The heartwood in trees 100 years old made 55 per cent. of the trunk, sapwood 33 per cent., and bark 12 per cent. The above are trees of dominant growth. An oppressed tree 200 years old would not be more than 112ft. high, with a diameter of 23.5in. Any person accustomed to watch trees in our English woods will have noticed some shoot up far ahead of others, which latter are then kept back by being overshadowed. In American forestry such trees are classed as "dominant," and "oppressed." There is an intermediate variety called "co-dominants," with a rate of growth between the other two. In the classification of sawn yellow pine scantlings or in the "grading" of them, as

the process is called in America, the same rules do not apply to boards an inch thick and to those above that thickness, for inch boards show one face only as a rule, whilst thicker stuff is used for doors and sashes where both faces are exposed; hence thick "uppers" are graded for quality, taking both faces into consideration, whilst for 1in. and thinner "uppers" one face only counts, so that an inch board may be "first clear" on one side, and "third clear" on the other side! In fact, the inspectors are informed that a piece of sawn yellow pine which is "A Select" on one side may be no better than "B Select" on the other, and "B Select" in front may be "C Select" behind. The architect and surveyor will not, of course, recognise these nice distinctions here. The different grades of yellow pine on the American market is astonishing, taking them in order of quality, the best being taken first. There are:—(1) First Clear, (2) Second Clear, (3) Third Clear, (4) A Select, (5) B Select, (6) C Select, (7) Shop Common, (8) Box and Stock Boards, (9) A Stock, (10) B Stock, (11) C Stock, (12) D Stock, (13) 1 Siding and 3/4 Ceiling, (14) No. 1 and No. 2 or A and B Siding, (15) No. 3 or C Siding, (16) No. 4 or D Siding, (17) Fence Siding, (18) 4in. and 6in. flooring, Drop Siding, Ceiling, and Partition, (19) No. 1 and A Flooring, (20) No. 2 or B Flooring, (21) No. 3 or C Flooring, (22) No. 4 or D Flooring, (23) First Common Boards and Fencing, (24) Second Common Boards and Fencing, (25) Third Common Boards and Fencing, (26) Dimension, First Common, (27) Second Common, and (28) Shipping Culls. In the last quality named the wood must be strong enough to be handled without breaking, and the predominating defect is red rot, covering more than half the surface. This grade borders on the absolutely worthless, even for firewood. In Philadelphia there are other grades of yellow pine, such as Shelving or Dressing, Cuts, Moulding, Case Boards, Barn Quality, Clear Fencing, Fencing, Promiscuous Width Fencing, German Siding, Bevel Siding, &c. In Toronto the grades are Clear Lumber, Picks, No. 1 Cutting up, No. 2 Cutting up, Fine Dressing, Common Dressing, Common Strips, Sap Strips, Common Dressing Strips, Common Strips, No. 1 Culls, No. 2 Culls, No. 1 Lath, No. 2 Lath, No. XXX Shingle, No. XX 6in. Clear Butts, and Culls. In Quebec Yellow Pine timber is selected free from rot, rotten knots, worm holes, open shakes and open rings; true sound knots are allowed. Boards are not less than 10ft. long, 7in. by 1in., equally broad from end to end, edged with a saw or trimmed to a straight line, free from rot, bad knots, vents, and shakes. When the architect has made himself thoroughly well acquainted with the various cuttings and gradings of Yellow Pine, he should study the defects in this timber arising from attacks by parasitic organisms. These are all examined and lucidly described in Hartig's "Zersetzungserscheinungen des Holzes." A perusal of this work will bring the reader's knowledge up to date, for a perusal of "Vitruvius," or that "master," Palladio, will not afford him much information about American Yellow Pine, its merits or its defects.

THE CAUSE OF THE CEMENTING VALUE OF ROCK POWDERS.*

IN the course of the investigation of rocks as road-building material, it early became apparent that in addition to the hardness, resistance to wear, and other physical, mechanical, and economical conditions that required consideration, the binding power, or as it has come to be called, the cementing value, was one of the most important factors in deciding as to the nature and value of the material. The description of methods of reducing the materials to powders, the formation from these powders of briquettes under constant pressure, and the subsequent impact testing by which the cementing value is obtained, has already been thoroughly described by Mr. L. W. Page, to whom the development of the study of the cementing value of rocks and the methods of impact testing is due. An outline description of the methods employed is all that is necessary here. The stone or other material is ground in a ball mill until it passes a screen with 40 meshes per centimetre. This sifted powder is then mixed with sufficient water to make a stiff "dough." After standing twenty-four hours,

cylindrical briquettes are made of standard size (25 by 25 millimetre) at a standard pressure of 100 kilogrammes per square centimetre. This is done in a specially designed hydraulic press. The briquettes are then dried in an air-bath at 100°, and tested in an impact machine which delivers a standard blow of 1 kilogramme falling 1 centimetre. The cementing value is measured in this laboratory by the average number of standard blows that a series of briquettes made from a rock powder will stand. It was realised from the beginning of the investigation that the phenomenon of the cementing power of rock dusts was possibly the result of several, if not many, causes. Among those which might be expected to have more or less influence may be mentioned: (1) Solubility, however slight, of the material or of certain ingredients of the material; (2) size and shape of the particles; (3) chemical reactions set up on moistening the powders, as in the cases of Portland cements, mortar, &c.; (4) crystalline forces operating under either (1) or (3), as in the cases of plaster of Paris, mortar, cements; (5) physical nature or condition of the particles and their relations to water: (a) unbound water, (b) hygroscopic water, (c) water of crystallisation, (d) water of constitution or combination. After many experiments in this laboratory, the conclusion was reached that, although the causes put down under the first four headings are to a certain degree operative in many cases, and even perhaps of paramount importance in exceptional ones, it is under the fifth heading that the true cause of cementing power and plasticity must be sought. If a rock powder is ignited at a temperature at which all the water of combination is expelled, the cementing power is invariably totally destroyed. No better indication could be had that the binding power is a function of the combined water, or of some condition of the particles which is invariably accompanied by the presence of combined water. Early in the investigation the idea had suggested itself that there must be a physical difference in the nature of the particles. Powders which cement well must be composed of particles which present to one another more or less "sticky" or adherent surfaces. As a matter of fact, a trained eye can at once detect a powder that is likely to give a high cementing value. A plastic powder when poured on a flat surface will form a more or less cone-shaped heap, while a non-plastic powder, to use the language of the clay-worker, "squats." Most authorities have rejected the notion that water of combination conditions the plasticity, for the simple reason that many totally non-plastic earthy deposits and minerals have a high water content. The difficulty has probably arisen from a failure to distinguish different kinds of water of combination. Experiments by the writer show that plastic powders moulded into briquettes under a given pressure apparently suffer a certain compression which is not shown by the material after the plastic condition has been destroyed by ignition. We have now to inquire if any reason can be found not only for this compression, but for the fact that it seems to accompany the plastic condition. Compressibility may be conditioned by (1) porosity and plasticity of the particles which would allow of their being "squeezed" into closer contact and configuration; (2) shape and size of the particles governing their resistance to close contact and the inclosure of voids. In this work it was found that the ignited powder always contained a much larger proportion of impalpably fine dust than the raw hydrated powders. This is shown not only by microscopic examinations, but proved by dropping the respective powders into water, when it is easily seen that the former contains a greater proportion of fine material which remains longer in suspension. It is conceivable that a hydrated material may possess a porosity so fine that the magnitude of the interstitial spaces is submicroscopic, perhaps not far removed from that of the water molecules themselves. The heating by ignition of a powder consisting of such hydrated particles would have a bursting or disrupting effect upon the particles, which would thus fall down to a mere impalpable dust. In order to investigate the effect of size of particle on the volume of briquettes it was decided to prepare glass powders of different degrees of fineness. A quantity of the best French plate-glass was accordingly powdered in the ball mill and sifted through a 0.25-millimetre mesh screen. A quantity of the sifted powder was shaken up with a large excess of distilled water, and allowed to

* Abstract of a paper by ALBERTON S. CUSHMAN, in the *Journal of the American Chemical Society*.

settle for ten minutes. The portion in suspension was then decanted to another vessel and allowed to settle again for thirty minutes; the decantation was then repeated, and the third or finest portion allowed to settle completely. The three portions were thoroughly dried in an air-bath, and the three powders examined under a high-power microscope fitted with a micrometer eyepiece, with a view to getting some notion of the comparative size of the particles in the respective samples. As the size of the different particles was in no case uniform, the best that could be done was to measure the largest particle that presented itself in each field, and then select one that seemed more nearly to represent an average; 20-gramme briquettes were then made from each of the three powders, and carefully measured. The extreme compression observed between the minimum and maximum volume in these glass briquettes is 2.5 millimetre, this corresponds to a calculated difference of 0.7 of a unit in the specific gravity. That is to say, if the powder had a specific gravity equal to 2.5, the finest would have to have a specific gravity equal to 1.8 in order to account for the variations. It is impossible to believe that such a homogeneous material as plate glass could be separated into portions of such widely different gravities, and, moreover, in spite of the difficulties attending the determination of the specific gravity of very fine powders, such wide differences could not escape experimental detection. As a matter of fact, determinations carefully carried out showed little or no deviations in specific gravity. The question then is, how are we to explain these results? As far as the writer is aware there is little information available in the literature on the volume relations of fine powders under given pressures. If the glass is crushed to fragments these fragments can be compressed to a certain degree by a given pressure; if we break these fragments still smaller, the resulting fragments, however tiny, are made up of particles arranged in more compact order and in less space than they could be arranged again if once set free. From purely theoretical consideration, therefore, we may say that in reducing the fineness of a powder we are approaching an ideal condition of unit particles which cannot be forced by any ordinary pressures into the same space they occupied as part of fused masses. Turning again to the results on rock powders we are led to the conclusion that the driving off of water of combination breaks up the particles to a finer dust, also that this destruction of the particles leads to loss of plasticity. As there were on hand in this laboratory a large number of thoroughly air-dried samples of rock powders and clays, of which the cementing value was known, it was decided to determine the water content of these, with a view to seeing if indeed any relation could be traced between cementing value and water of combination. The determinations were made by igniting the powders in a platinum boat contained in a hard glass tube and absorbing the water set free in a weighed sulphuric-acid bulb-tube. An inspection of the results shows that high cementing values have a decided tendency to accompany a high water content. At the same time, there are several exceptions revealed, and it is probable that an even greater number of results would show other discrepancies, as it is well known that many minerals with high water content do not yield plastic powders. On the other hand, if a certain kind of water of combination invariably accompanies the plastic condition, this active water would be added to the inactive and an explanation furnished, not only for the general tendency, as shown above, but also for the exceptions to it. We have to inquire what is meant by water of combination. Probably no term in chemistry has been more loosely used than this. Ordinarily speaking, it refers to the water which is contained in a substance in such a way that no amount of drying at 100 centigrade is able to dislodge it. In this way it is differentiated from unbound water, and probably from hygroscopic moisture. Such a definition, however, would include as a general thing water of crystallisation, which is not usually meant when we speak of water of combination. Nearly all metallic oxides and many salts have the power of entering into that peculiar hydrated, non-crystalline condition which Graham in 1861 denominated colloid or glue-like. As a result of extensive investigations Van Hamelen adopts the suggestion of Nageli of the micellian structure of colloids, that is to say, that these curious substances consist of heterogeneous molecular complexes which possess

a submicroscopical, web-like, porous formation, one of the distinguishing characteristics of which is the peculiar relation to and dependency upon water which they exhibit. The water content of these hydrogels (inorganic colloids) varies continually with the temperature and the vapour-pressure of the atmosphere in which they find themselves. Dried at high temperatures up to a certain critical point, they will lose nearly all their water, only to take it back again eagerly when allowed to cool in free air or in moist atmospheres. This dehydration and rehydration can be repeated indefinitely unless the temperature of drying is carried too high, when the faculty is gradually lost and finally destroyed. We have here to do with a certain kind of water of combination which we shall designate micellian water. It is just as much a characteristic of the plastic or colloid condition as water of crystallisation is a characteristic of many crystals, although we can have the water in these colloids replaced by organic liquids. Micellian water is absorbed into the structure of the particles of a powder of an inorganic hydrogel without changing the physical appearance, even under the microscope. Hygroscopic water is usually absorbed on the particles, producing a distinct appearance of wetness. Heating does not usually destroy the hygroscopic qualities of a substance; it invariably destroys the absorptive power of the micellian structure, if pushed far enough. It is not the purpose of this paper to review the work that has been done on colloids. The immediate object is to call attention to certain significant qualities which are shared in common by such inorganic hydrogels as silicic acid and ferric hydroxide on the one hand, and plastic clays and rock powders on the other. Both contain combined water: both lose water on heating, and take it up again on cooling in moist atmospheres. Both gradually lose this power on continued heating at high temperatures, and finally lose it entirely, together with plasticity, if the heating is pushed far enough. Very highly plastic clays and rock powders, after working up with water, usually shrink and deform on drying out: this quality is also universally noted in the case of the hydrogels. Silicic acid which has been air-dried can have water pressed out of it by subjecting it to very high pressures; the same phenomenon is known in the case of clays in the manufacture of hydraulic pressed bricks. It has been frequently claimed that the cause of plasticity is to be sought in the aluminium silicate (kaolin) which forms the essential ingredients in all clays. If plasticity is a question of a colloid condition of the particles, it seemed that plastic clays and rock powders ought to show the same peculiar relation to water as is shown by the hydrogels, and in a diminishing degree as the plasticity diminishes. In order to study the subject, a special form of furnace was devised that could be heated by a blast-lamp to any desired temperature up to 11,000° Cent. The temperatures were measured by means of a Le Chatelier platinum-rhodium pyrometer. No difficulty was experienced in maintaining the temperatures constant to within a few degrees. The mode of procedure was as follows:—Exact two-gramme samples of the various substances were heated in the furnace for exactly one hour, cooled in a desiccator over concentrated sulphuric acid for one hour, weighed as quickly as possible, and finally exposed under a large bell-jar over dilute sulphuric acid (24 per cent.), which had a vapour-pressure of about 18 millimetres at 24° Cent. At this vapour-pressure water does not absorb on the surface of glass or the particles of powders so that all gains in weight are a true measure of affinity for water. As nearly as possible, this bell-jar was kept at a constant temperature during the experiments, but when any considerable variation occurred, corrections were made to the results. The silicic acid hydrogel was prepared by neutralising sodium silicate with dilute hydrochloric acid, and washing the jelly by dialysis until the salt was entirely removed. The pure jelly was dried to a certain point on the steam-bath, and finally allowed to air-dry. The resulting white powder, which had every physical appearance of being dry, was found to contain about 20 per cent. of water. The hydrogels of iron, alumina, and magnesia were precipitated by dilute solutions of sodium hydroxide, thoroughly washed by decantation and finally air-dried. Finally, three samples of clay were selected for comparison. Clay No. 1 was highly plastic, clay No. 2 less so, and clay No. 3 contained an unusual amount of calcium carbonate. The results indi-

cate that identically the same peculiar power of absorbing water, which is gradually destroyed by heating, is possessed by clays and colloids. The difference is merely in degree. No amount of heating will destroy the power of lime, magnesia, and alumina to take up water again. Whatever theory we may hold as to the relation of water to these substances in the process of "slaking" it is quite certain that it is an altogether different phenomenon from the process which goes on when water is absorbed into the peculiar structure of a colloid. A question that naturally arises is, How are we to account for the well-known high binding powers of many homogeneous crystalline rocks, such as limestones and dolomites? As a matter of fact, pure calcium carbonate has no cementing value whatsoever; this quality is provided by certain hydrated impurities such as silica, ferric oxide, or even clay. The amount of these impurities need not necessarily be very large, but the distribution throughout the mass is probably of a very intimate nature. It has long been known to practical road builders that the binding power of many rocks increases as time goes on, under the combined influence of the action of traffic and water. Every potter knows that the plasticity of clay increases under the action of kneading and working with water. In some industries clay mixtures are stored away for considerable periods under wet blankets. This process is called "sweating," and is believed to be very beneficial. It has lately been suggested that bacterial fermentations are responsible for the improvement in the quality of clays under such treatment. The writer has no data on this subject, but it is well known that many of the nitrifying bacteria flourish in media composed of inorganic colloids, which suggests that the presence of bacteria may be a concomitant rather than the cause of improvement. Experiments in the laboratory have shown that the cementing value of briquettes is increased if the dough made from a rock dust is allowed to stand for some time before being moulded, and it is still more increased if the dough is kneaded. In summarising the results as presented in this paper it may be said that it has been pointed out: (1) That the cementing power of rock powders is a property similar to the plasticity of clays. (2) That all rock powders that have cementing power show the same peculiar relation to water that is shown by substances that possess an amorphous colloid structure—i.e., they can be dehydrated and rehydrated, until, by prolonged high heating, the structure is destroyed. It is not the intention of the writer to maintain that the gelatinous mass in which silicic acid separates from a dilute solution is in any way comparable to a plastic mass. The question is purely one of the conditions of the particles which go to make up the mass of plastic rock powder or clay. In the opinion of the writer, particles which are entirely crystalline in their nature have nothing to do with plasticity except to act as a diluent. It is the amorphous particles which, by reason of their characteristic structure, are able to absorb water and assume the condition which causes them to exhibit that coherence which in the mass we denominate plasticity.

BUILDING SUPERINTENDENCE.*

A GOOD title for a practical work on building, written by Mr. T. M. Clark, a Fellow of the American Institute of Architects. There are few treatises bearing on superintendence, although expositions on construction are numerous, the fact being that the superintendence of buildings is an art that is only learned by experience, and is largely a personal matter. The present "Manual for Young Architects, Students, and Others" has gone through several editions, and has now been rewritten and revised to meet the many requirements of modern construction. The Manual applies chiefly to American practice and construction, and is therefore in some things rather strange. The chapters contain the chief methods of construction used in the States. We have, first, the construction of a stone church; next a "wooden dwelling-house," then the "construction of a steel-frame building." The latter is an important introduction, as the steel-framed structure differs from everything else, and requires,

* Building Superintendence: a Manual for Young Architects, Students, and Others. By T. M. CLARK, F.A.S. I.A. New edition, revised, copiously illustrated. New York: The Macmillan Co.; London: Macmillan and Co., Ltd.

as the author says, special study. The remarks on stone buildings include some useful information on masonry, exterior stone facing, such as "neat random ashlar, quarry face and pitched joints," a kind of walling generally understood in this country. We quote the description: "This means that all the exposed surfaces are to be freshly split without weather-worn faces, such as would be admissible if 'rock face' were specified, and that the joints, instead of irregularly projecting, as is permissible in some engineering work, are to be 'pitched off' to a line previously drawn round the stone, all parts of which lie in a true plane at right angles with the surfaces formed by the joints. This is done by 'pitching-tool' or wide chisel with a very thick edge, and the result is to furnish blocks, which, however rough and projecting in the centre, all possess four well-defined edges, by means of which they can be placed upon and under each other with as much accuracy as the smoothest-faced stones." The stonework of broach spires are specified to have chiselled draft lines 2in. wide. These terms are explained, and the tools used, such as the "crandle," a toothed hatchet, composed of 8 or 10 pointed chisels wedged tightly into a frame with a handle. With this tool the surface of stone is obliquely struck until the inequalities have been reduced, and the surface covered with short parallel furrows. These are then crossed by other furrows, and by this means a smooth surface is formed, covered with a network of lines. The joints are then formed by a chisel draftsunk all round the face. Other operations, "droving," "pene-hammering," "bush-hammering," &c., are described and illustrated by good sketches. The remarks on "setting out the building" contain some useful information on the laying-out of the exterior lines of building, the setting-off of the angles by two tapes, or by using "three, four, or five rule" on a string, and other rule of thumb methods. These methods are all illustrated by diagrams. Then the method of striking the curve of apse of church is shown. The architect should always be present to see the staking out of a building, and verify the measurements and accuracy of the angles by measuring the diagonals. The author recapitulates the things to be remembered in the first laying-out and staking. The second visit includes the excavation, and the third and fourth visits are made the opportunity of describing the artful devices of foreman and builders in the foundations and masonry. In this way every part of the masonry construction is discussed, and other trades receive attention in their turn. The points that deserve attention in supervision are particularly noticed, and practical rules for calculating the weights on the foundation, floor loads, column loads, &c., are given as they occur. "Modern Dwelling Houses" forms the next subject, and all the difficult points of construction in timber framing and bedding in masonry, braced framing, "balloon" framing, brickwork bond of chimneys, flues, roofing, shingles, plumber's work, electric wiring, and other details are treated. One feature of this book is that the smallest details, like window fittings, door furniture, water closets and fittings, testing drains, &c., are dealt with. The chapter on the construction of a steel frame building is shorter, but concise, and many useful remarks are made. The Form of Specification is useful, and a chapter on contracts is given. The work may be regarded as a manual of practical construction, but referring to many points which the theoretical treatises entirely overlook. It is a practical guide that the young architect will find of service in his daily work and rounds.

ESTIMATING AND PRICING QUANTITIES.*

NO book, however capable and up to date, can constitute a really adequate substitute for a competent estimating clerk, whose figures in the majority of cases alone can be relied on in tendering with success in competition. It is one thing to secure a job, and quite another matter to be landed with a contract at a figure below a commensurate equality with the cost of the work undertaken, as any tyro in building matters can perfectly well realise. The mere statement of so elementary a factor in profitable trading looks so self-evident that it seems foolish to state it on paper; but, for all that, many a builder, to his

financial loss, has found out its reality and ease of falling into such a position unwittingly. The cost of labour is the greatest factor in mistakes of this kind, and the enterprising country contractor anxious to get a footing into the Metropolis or some other centre of industry finds out, often enough to his cost, how necessary it is to study local difficulties and conditions. No book can exactly supply such information, and Mr. George Stephenson in the preface to the fifth edition of his handbook on "Estimating," which Mr. Batsford has just published, does well to repeat what was said in the first edition as to the need of visiting the site and noting its surroundings in reference to getting materials upon it, the available space to work in, and the nature of the soil. Labour, after all, is the leading speculative item nowadays. The system adopted by the author of this handy aid, when you know how to make practical and proportionate use of it, is to add the builder's profit to each item instead of lumping a percentage on the total. Throughout all the trades Mr. Stephenson carefully indicates how to adapt prime costs into profitable undertakings at competition prices, though, after all, in most trades only experience can give the tenderer the knowledge which will enable him to qualify his figures so as to retain a remunerative margin without making his prices prohibitive. In all tendering there must be many speculative items, such as cutting away for and making good in all trades for all trades, especially where jobbing work comes in at all. Something, too, and at times a great deal, depends upon the special requirements and disposition of the architect supervising the contract. To know your man is of the greatest possible importance, even though only good work is asked for and specified, and also intended to be given by the builder. No book can pretend to furnish such knowledge as that; but in so far as a writer can assist an estimator, Mr. Stephenson has carefully and reliably supplied the information available, and he gives it in a compact and handy form under the usual trades common to ordinary builders' contracts.

On Monday the Archdeacon of Salop dedicated a new organ, which has been placed in Condover parish church by public subscription at a cost of £580, and also a stained-glass window erected in memory of two parishioners. The organ was built by Messrs. Nicholson and Lord, of Walsall, and has two pitch-pine fronts, with spotted pipes. The window is in the south aisle. It depicts the Wise Men bringing gifts to the Infant Christ. The artists were Messrs. Hardman, of Birmingham.

Mr. John Fairweather, A.R.I.B.A., 136, Wellington-street, Glasgow, has been appointed architect to the Glasgow East End Industrial Exhibition, which opens next December. Four competitive designs were submitted to the exhibition council, and from these the council selected those of Mr. Fairweather, as being the most practical and suitable for the exhibition. Much originality and resource was shown in the adaptation of the present buildings and grounds, and in the treatment of the entrance facade and concert-hall. The latter is designed to accommodate 3,500 persons, and the platform, in addition to the usual accessories, will have a fine orchestral organ.

The statue of the late Sir Edward J. Harland, Bart., which stands in a commanding position in front of the new city-hall buildings at Belfast, was unveiled on the 23rd ult. by the Earl of Glasgow, in the presence of a large assembly of citizens.

The Rev. Henry Edward Fowler Garnsey, B.D., senior Fellow of Magdalen, and the last but one of the surviving Fellows upon the original foundation of the college, who died on Monday at Bath, aged 77 years, informed the college a short time since that he wished to hand over the sum of £5,000 to be expended in replacing Wyatt's plaster ceiling to the college hall by a timber roof, resembling, as far as might be, the original, which was removed rather more than a century ago. The college has obtained designs from Mr. G. F. Bodley, R.A., and during the past year the roof has been constructed and is ready for erection. By a singular coincidence the first actual step towards placing it in position was taken on the very day of the donor's death.

The Board of Trade have determined to confirm the Order of the Light Railway Commissioners for the construction of light railways, or rather electric tramways, at Maidstone, as to Railway No. 1, from High-street to the borough boundary, but not as to Railway No. 2, from the borough boundary to the Bull Inn, Barming.

A Bangkok telegram says that a contract for 30,000 tons of rails for Siamese railways has been given to Messrs. Dorman, Long, and Co., of Middlesbrough.

OBITUARY.

It is with deep regret that we record the death of Mr. HENRY J. BYRNE, the chief of the staff of Messrs. Eastwood and Co., Ltd., Lambeth, on the 24th ult. The deceased, although only thirty-five, had been connected with the firm for over twenty-three years, and for ten years had been the confidential clerk and private secretary to Mr. G. E. Wragge, the managing director. The funeral took place at Barnes on Monday, and the esteem and affection in which Mr. Byrne was held by every member of the firm, as well as by all those with whom business or leisure brought him in contact, was evidenced by the large attendance of all classes at the funeral and at the memorial service, which, by the kindness of the vicar, the Rev. E. Gordon, was held at St. John's Church, Waterloo-road.

THE death occurred last week, at his house, Thames View, St. Margaret's, near Twickenham, of Mr. FRANCIS TIMMER GOMPERTZ. He was the eldest son of Mr. Solomon Gompertz, and was born in 1831. He early turned his attention to the subject of Classical architecture, and received the silver medal of the Royal Academy in 1856, as well as the gold medal of the Royal Academy in 1857, for his work in his designs for new municipal buildings, and was again awarded, in 1859, further first-class honours for his proposals for a cathedral in the Mediaeval Gothic style, and for his proficiency in the same class of work. After his marriage he travelled much, in company with his wife, throughout the by-ways of England and in Southern Europe, and it is in a measure due to these extended travels that his valuable art collection was completed.

CHIPS.

The corporation of Southampton have accepted the tender of Messrs. H. Stevens and Co., of that town, at £11,136, for the erection of a new electric light station, from plans prepared by the borough engineer.

Mr. Frank H. Gorst, the sole partner in the firm of Messrs. Richard Gorst and Son, architects and surveyors, of 7, Birley-street, Blackpool, has been selected to be the architect for the new church to be built for the All Saints' parish, Blackpool.

The Bishop of Lichfield dedicated, on Monday, an enlargement of St. John's Church, West Bromwich, consisting of north and south transepts, a choir vestry, and organ-chamber, which have been erected at a cost of £1,400.

The Mayor of Leamington formally opened, on Friday, the new Horsfall refuse destructor, which has been provided at a cost of £7,651, and also the new Mill Gardens, suspension bridge, turbine, and weir.

The memorial to the late Sir Henry Bessemer, inaugurated at a Mansion House meeting on Monday, will have as its first object the establishment of completely-equipped metallurgical teaching and research works in London.

A new cottage hospital at Exmouth was opened by Lady Gertrude Rolle on Saturday. Wards containing six beds each, one for men, the other for women, lie upon each extremity of the frontage, and are connected by a wide corridor, upon which open two small wards for special cases, a committee room, and matron's room. At the rear are the operating room, ward kitchen, bathroom, and the out-patients' department. The kitchen and offices, together with bedrooms and sitting-rooms for the four nurses, are upon the first floor. Messrs. Teit and Harvey, of Exeter, were the architects, Mr. Albert Hayman, of Exmouth, was the builder, and Mr. Mansfield, also of Exmouth, clerk of works. The cost has been £4,000.

The Rutland Archaeological and Natural History Society had an excursion on Wednesday in last week to the churches of North Luffenham, Edith-weston, and Manton.

The South African War Memorial at Clevedon, Somerset, was unveiled on Saturday. The monument takes the form of a column of the Tuscan order, 18ft. high. It is of Scotch granite, highly polished, and the capital, with dove and wreath, is carved from Sicilian marble. The design is that of Mr. Hans Price, architect, of Weston-super-Mare, and the work has been carried out by Mr. J. N. Cox, sculptor, of Clevedon.

On Thursday afternoon in last week the cornerstone was laid of St. Gabriel's Mission Church, which is being erected to meet the requirements of the Ruddyard side of Horton parish. Mr. J. T. Brealey has prepared plans for a building to accommodate 100 worshippers. The tender of Messrs. Heath and Bowyer, of Ruddyard, amounting to £675, was accepted, and with the interval fittings the building will cost £850.

* Estimating: a Method of Pricing Builders' Quantities for Competitive Work. By GEORGE STEPHENSON. B. T. Batsford, 94, Holborn, W.C. 4s. 6d. net, cloth.

Building Intelligence.

ST. ALBANS.—Memorial-stones were laid last week of the new Roman Catholic Church, now in course of erection in Beaconsfield-road. The church is to be in the Romanesque style, the building, having a frontage to Beaconsfield-road, and backing on to the Midland Railway, consisting of a nave of eight bays and aisles. The main entrance will be by double doors at the north end, and from the north-east corner will rise a tower with open bell turret, surmounted by a large cross, the measurement to the top of which will be about 86ft. The entire building is to be carried out in red brick, with moulded cornices and labels. At the southern end of the church will be a semi-circular apse for the altar, separated from the body of the church by a central arch, with niches on either side to receive the statues of the Virgin and St. Joseph. The sanctuary will extend to the first bay, the altar being approached by seven steps. The roof is to be trussed and panelled, the building being lighted by seven clerestory windows and windows inserted at the north end. Hopper ventilators will be inserted in the windows. The heating will be by means of hot-air generated in an underground chamber at the south-eastern end of the building, the sacristy being erected above. It is estimated that the building, when completed, will cost about £6,000, and will be capable of seating about 780 persons. For the present, however, it is proposed to proceed only with the apse and four bays—practically half of the nave—at a cost of £1,500, affording seating for a congregation of about 250, together with the sacristy and heating chamber. The architects are Messrs. John Kelly and Son, of 166, Oxford-street, W., and the contractors Messrs. C. Miskin and Sons, of St. Albans.

ST. BARTHOLOMEW'S HOSPITAL.—The sub-committee on building of the Lord Mayor's Committee of inquiry into the affairs of St. Bartholomew's Hospital met on Friday at the Mansion House, the Lord Mayor presiding. Alternative plans for the proposed improvements at the hospital were submitted by the architect, Mr. E. R. Panson, F.R.I.B.A., and considered, together with reports upon them by the medical council. The inquiry is now practically completed, but another meeting of the full committee will be held at the Mansion House as early as possible, in order to agree upon a report. A new out-patients' department being imperatively necessary, it was decided by the committee that that work ought to first be proceeded with. The estimated cost of the work is about £100,000.

A second section of the electrified portion of the L.C.C.'s South London tramway system was opened without ceremony on Thursday afternoon in last week. This is the route running from Camberwell Green to St. Mark's Church, Kennington Common, via Camberwell New-road, about a mile in length, which has been converted from a single line worked by horse traction to a double line electrically equipped, while the thoroughfare has been paved throughout with wood blocks, and is being widened between Camberwell Green and Warner-road. At Kennington Common the tramcars run over the previously opened routes to the bridges of Westminster, Waterloo, and Blackfriars. A further section, from St. Mark's Church, Kennington, via Harleyford-road (which is being widened at its southern end), to Vauxhall Station, will soon be completed.

A fire, causing damage to the extent of £20,000, occurred on Saturday evening at the extensive wood-working depot of Messrs. Grimwood and Sons, building contractors, Sudbury, Suffolk. A man named George Shipman, who had tramped from London and sought work, is under remand on a charge of arson. About 100 workmen are thrown out of work, and some 15 had all their tools destroyed. On the adjoining premises stands the historic walnut tree under which Cromwell used to paint. It fortunately escaped injury.

The 6th annual report of the Deputy Keeper of the Public Records, just issued as a Parliamentary Paper, states that the chief event of the year was the opening to the public during certain hours of a museum, built upon the site of the Rolls Chapel, retaining its old monuments and stained glass, and containing an interesting collection of selected historical documents, illuminations, autographs, and other objects.

The parish church of Hartshorne, Derbyshire, has just been reopened after enlargement and restoration from plans by Mr. G. F. Boley, R.A.

Engineering Notes.

PROPOSED FORTH AND CLYDE SHIP CANAL.—Messrs. D. and C. Stevenson, civil engineers, Edinburgh, have been engaged for some weeks surveying the valley between the estuary of the Forth and Loch Lomond for clients; and this firm has now been instructed to prepare plans for a canal to connect the Firth of Forth with the Firth of Clyde. The plans will be prepared forthwith, and they will be lodged in November for the purpose of securing Parliamentary powers for the scheme. The route the engineers state the proposed canal will take is from Alloa, on the eastern side, where it will pass to the north of the links of the Forth and to the northward of the town of Stirling. Passing along the valley of the Forth near Kippen, a deep cutting will take the canal into Loch Lomond, near Buchanan Castle. The navigation will then be on Loch Lomond to Tarbet, and another deep cutting will take the canal to Loch Long, which will be the outlet on the west. Loch Long is an arm of the sea providing a safe anchorage, and navigable by all classes of vessels. The actual distances of the canal are as follows:—From Alloa to Loch Lomond, 28 miles; Loch Lomond to Tarbet, 14 miles; and Tarbet to Arrochar, 1½ mile. Arrochar is at the head of Loch Long, and lies 15 miles from the Clyde. The actual cutting extends to 29½ miles, and the chief engineering difficulties will be encountered near Loch Lomond, where a very deep cutting will be required, and again at the narrow neck between Loch Lomond and Loch Long. The surface of Loch Lomond is 22ft. above the mean sea-level, but the hard on the strip between Loch Lomond and Loch Long rises to a maximum height of 130ft. above mean sea-level. The canal, if carried out, would shorten the passage by 529 miles between the Clyde and East Coast ports.

NORTH BRITISH RAILWAY COMPANY'S NEW LEITH-EDINBURGH LINE.—The new North British Railway line between Leith and Edinburgh, which has been in course of construction for the last four and a half years, was opened for traffic on Wednesday. The line is about a mile long, and starting from the Central Station, which practically extends from the foot of Leith-walk to Easter-road, it runs at a height of about 15ft. above the street level, behind Duke-street, cuts through Glover-street, and is carried over Easter-road by a bridge. From this point the railway runs through the Eastern Sawmills, almost parallel with Lochend-road, and near where this road is crossed by the Caledonian Railway Company's new line the railway dips into a cutting 35ft. deep, which enables it to pass under the Caledonian Company's line. It is then carried through the farm between Lochene Loch and the Eastern Cemetery, and joins the suburban line a little below Abbeyhill Station. The Central Station has a frontage of 220ft. in Duke-street, where it is four stories high, and 200ft. in Leith-walk, where it is only two stories high. On the street levels shops have been erected, and above them are the station, waiting-rooms, and offices on the platform level. The other two stories in Duke-street consist of dwelling-houses for the railway officials. The main entrance and the booking-hall are at the corner of Duke-street and Leith-walk, and at this corner the building is surmounted by a three-dialled clock. The station is 830ft. long and 220ft. broad at its widest point, and the entire building is roofed with glass, supported by one-span iron girders. There are four platforms, and hydraulic hoists have been erected at Duke-street and Easter-road respectively for the conveyance of heavy luggage into the station, which is lighted throughout by electricity. The contractors for the building were Messrs. G. and R. Consins; and for roofing, Sir William Arrol and Company, Glasgow. Messrs. Blyth and Westland, C.E., were the engineers.

WICK AND LEBSTER LIGHT RAILWAY.—This railway, which was opened for traffic on Wednesday, having been inspected by Major Druitt, of the Board of Trade, is 13½ miles in length. The estimated cost was slightly over £70,000. The Highland Railway Co. undertook the construction of the line. The engineer is Mr. Roberts, C.E., Inverness, and the contractor Mr. William Kennedy, Partick. The track starts from the west end of the Highland Railway Station at Wick, a short distance from which it curves to the left, and proceeds in a southerly direction for

the rest of the way, running parallel with the country road. Intermediate stations are provided at Thrumster, Ulbster, Clyth, and Occumster.

CHIPS.

It having been announced that new building by-laws are likely to be adopted soon by the Rochdale Corporation, some of the local builders are hastening to get plans sanctioned under the existing regulations. To a great extent this explains the fact that at their meeting on Thursday in last week the building committee had the plans for no fewer than 225 proposed new houses submitted to them for approval.

A Local Government inquiry was held at Castle Eden Colliery on Friday by Mr. A. A. G. Malet, inspector, into an application of the Easington Rural District Council for sanction to a further extension of the sewerage scheme for Monk Hesleden. Messrs. D. Balfour and Son produced information as to the scheme. There was no opposition.

The foundation-stone of St. Augustine's Church at Dovercourt will be laid by the Earl of Warwick with Masonic ceremonial on Saturday in next week, the 11th inst.

The new Rhætian Railway, whereby the journey from London to the Engadine will be accomplished in 30 hours instead of three days as hitherto, was officially inaugurated on Sunday, in the presence of the Federal authorities. The line was opened for general traffic on Wednesday. The construction of the railway was begun in October, 1898, and four years have been occupied by the boring of the Albula Tunnel, which is 5,866 metres in length. The railway starts from Thusis and runs to Celerina at present, but will open to St. Moritz next year.

A new organ screen has just been presented to Llandaff Cathedral by Mr. F. Insole, and was formally unveiled in last week. The screen was designed by Mr. J. H. Seddon, of the firm of Messrs. Seddon and Carter, architects, Cardiff. The work, which is in teakwood, has been carried out by Messrs. Clarke, of Llandaff.

The Lancashire and Cheshire Antiquarian Society visited Arbor Low on Saturday. The party included Professor Boyd Dawkins, Mr. W. J. Andrew (who has conducted excavations), Mr. W. E. A. Axon (the president), and Mr. G. C. Yates (the hon. secretary). Professor Dawkins pointed out the striking resemblance between Arbor Low and Abury.

A stained-glass window has been placed in All Saints' Church, Maidstone, in memory of the soldiers of West Kent who fell in the war. It was executed by the firm of Lavers and Westlake, Art Glass Works, Eadell-street, Bloomsbury.

A Committee of the House of Lords has passed the preamble of the City and South London Railway Company's Bill for the extension of their line from the Angel to Euston, and the construction of a new "tube" from Brixton to King William-street, E.C. The Bill has already passed through all stages in the House of Lords.

A Local Government Board inquiry was held at Norwich last week before Lieut.-Col. A. C. Smith, R.E., as to an application from the city council for approval to the borrowing of the sum of £1,550 for the purchase of the premises Nos. 3 and 5, Migdalen-road, and the conversion of the same into a divisional police-station.

At an early meeting of the London County Council the Improvements Committee will submit for approval a proposal for the execution of certain street widenings in South London in connection with a scheme for the construction of a new tramway from Camberwell Green to Lordship-lane. The thoroughfares proposed to be widened in certain parts are Denmark Hill, Champion Park, Grove-lane, Dog Kennel-hill, Grove-vale, and Lordship-lane. The gross cost of the improvement is estimated at £119,900, of which £78,900 represents the cost of acquiring property and £41,000 the cost of the necessary paving and other works.

In the case of the application made for a discharge from bankruptcy on behalf of John Thomas Roach Pengelly, otherwise H. R. Nathan (trading as H. R. Nathan), Chingford, late Rotorna, Upper Walthamstow-road, Walthamstow, N.E., builder, an order of discharge has been refused.

The new superintendent of buildings in New York recently did a courteous thing in offering to a number of the principal architects in the city the nomination of a chief inspector, promising to appoint anyone that they might nominate, whether he knew him or not. The choice fell upon Mr. Walter T. Smith, of New York, who was for several years superintendent for Messrs. Carrère and Hastings, and acted as general superintendent of construction of the buildings for the Pan-American Exposition at Buffalo. According to his promise, Mr. Thompson immediately appointed Mr. Smith.

PROFESSIONAL AND TRADE SOCIETIES.

BRISTOL CIVIL ENGINEERS AT NEWPORT.—The Bristol Association of Engineers visited Newport, Mon., on Friday, for the purpose of inspecting the public works which the corporation have in hand. They were met at Magor Station by Alderman T. Canning (a member of the Newport Waterworks Committee) and R. H. Haynes (borough engineer), and were driven to Wentwood, the site of the great waterworks which will supply the Newport of the future. Alderman Canning gave a general account of the works, the main feature of which is a reservoir to contain nearly 400,000,000 gallons; and Mr. Baldwin Latham (consulting engineer) and Mr. J. Macdonald (works manager) explained the works in detail. The party were entertained at luncheon by Mr. Latham, and after lunch they drove to Newport in brakes, inspected the new electric power station, went on to Messrs. Lysaght's Orb Works, visited the site of the new transporter bridge (the first on that principle to be erected in the United Kingdom), and returned to the King's Head for dinner, prior to returning to Bristol. Among the party were the president (Mr. A. P. I. Cotterell), Mr. Pearson (chief waterworks engineer), and Mr. Irvine (Bristol gas engineer).

CONFERENCE OF SANITARY INSPECTORS.—The seventh annual conference of the National Union of Sanitary Inspectors, founded in 1887, and having at present a membership of 413, was held on Thursday, Friday, and Saturday at the town-hall, Stratford-on-Avon. Prior to the conference, the annual meeting of the union was held, and was followed by the annual meeting of the Midland District Centre. In their annual report, the executive council of the union recorded another successful year, and congratulated the members upon the standard of the work of the session, and on the satisfactory condition of the union in general. There had been an increase in membership of 15. One hundred and ninety-two sanitary districts were now represented. The roll of members included representatives from thirty counties in England and Wales, and the influence of the union had made itself apparent in several of the southern counties. The financial condition of the union was very satisfactory. The council had to again express regret that the introduction of the long-deferred Bill for the codification and amendment of the Public Health Acts had again been postponed, and the dropping of the Bill introduced by Sir Francis S. Powell, M.P., president of the union, which had for its object the amendment of the law relating to the qualification and tenure of office of medical officers and inspectors, and provisions as to superannuation allowances, was to be deplored. The council had resolved to petition the Local Government Board repudiating the opposition to the Bill of the Municipal Corporations Association, on the ground that it was founded on a misrepresentation of fact. The president of the union for the ensuing year will again be Sir Francis Powell, and Mr. H. H. Spears, West Bromwich, will act as chairman of the council. When the members assembled for the conference they were cordially welcomed to the town by the Mayor (Councillor G. M. Bird) and Alderman Park (chairman of the sanitary committee). Among the papers read was one by Professor Boyce, on "The Necessity for the Provision of Systematic Sanitary Training, in View of the Rapid Progress of Sanitary Science." Mr. J. Brook, Stratford-on-Avon, gave information concerning the condition of affairs in his own district, and its sanitary progress during recent years.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS BACK UP LORD PENRHYN.—At a special meeting of the Council of the National Federation of Building Trade Employers of Great Britain and Ireland, held at the Midland Hotel, Derby, the following resolution was moved by Mr. William Sheppard, L.C.C., London:—"That the members present at this meeting of the Council of the National Federation of Building Trade Employers of Great Britain and Ireland desire to convey to Lord Penrhyn their appreciation of his successful defence, and persistent maintenance of the principles of freedom of contract, liberty of the individual, and security of property. The members also desire to thank Lord Penrhyn for his attitude in respect to these principles, and express their sincere regret at the attempts which have been made to misrepresent Lord Penrhyn's conduct." The motion was seconded by Mr. W. M. Blackburn (Cardiff), and

was carried unanimously, the formal resolution being signed on behalf of the Federation of Building Trade Employers of Great Britain and Ireland by Mr. C. W. Green (president) and Mr. C. Alfred G. Hassall (secretary).

CHIPS.

During the past week Mr. Carnegie has promised the following amounts for free libraries, on the usual conditions:—Leyton £8,000 (for two buildings), Torquay £7,000, Ramsgate £7,000, Twickenham £6,000, Stoke Newington £4,000, Crompton £2,500, St. Anne's-on-Sea £3,500, and Lurgan £2,000.

Messrs. E. H. Shorland and Brother, of Manchester, have recently supplied their patent Manchester grates and exhaust roof ventilators to the Culcheth Cottage Homes, near Warrington.

At the council-chamber, Birmingham, on Friday, Mr. H. B. Boulnois, Local Government Board inspector, held an inquiry into the merits of a scheme prepared by the London and North-Western Railway Company for providing new dwellings for persons of the labouring class. The London and North-Western Company propose to acquire thirty-three houses near Monument-lane Station for the purpose of improving the railway. The houses were occupied by persons of the labouring class, and accommodation will be provided for the persons displaced, numbering 122, by houses at no great distance from those pulled down. It was intended to erect nineteen new houses, each house containing five rooms, with yard, &c. Further information was given to Mr. Boulnois by Mr. Stannard, district estate office of the company. Messrs. Ball and Hatley, of the chief estate office, were also present.

The new Church and Sunday-schools erected by the United Methodist Free Church body at Catchgate, near Annfield Plain, were opened on Friday. The church, which is built of stone, will accommodate some 500 worshippers, and provision is made in the Sunday-school for about 300 children. The designs were prepared by Mr. Alfred Davis, of Burnopfield, while the contractors were Messrs. Ayton and Sons, of Benfieldside. The total cost is over £2,100.

Foundation-stones were laid on Monday of a new Wesleyan Church at Milburn, near Ponteland. The church has been designed to seat over 200 persons; a large vestry is arranged so that on special occasions this may be used for extra seating accommodation by means of a sliding partition. The plans show a building in a simple treatment of Gothic. The contractor is Mr. Wm. Boiston, of Higham Dykes, the architects being Messrs. Marshall and Tweedy, Newcastle.

At their last meeting the corporation of Ipswich decided to purchase two additional parks for the borough. One of these is the higher portion of the grounds attached to the late Jeremiah Byles's mansion in St. Helen's parish; it is well-wooded, and contains 11½ acres, and will cost £7,000. At the same time, a fringe for widening St. Helen's-street and Nottidge's-lane will be taken off the lower portion of the estate, the remainder of which will be built over. The second fresh open space is the Lower Arboretum, a well-wooded park-like enclosure lying between the Upper Arboretum and Christchurch Park, both of which are already in the possession of the corporation; it is 5½ acres in area, and has cost £900 and a rent charge for 25 years of £80 a year.

A new Board school at Badwas, Mon., was opened last week. It accommodates 450 children in two departments, and has cost £2,750. The architect is Mr. J. H. Phillips, of Cardiff and Caerphilly, and the contractor Mr. Marcus Harding, of Caerphilly.

The Local Government Board have sanctioned the borrowing of £1,052 for the construction of a refuse destructor by the corporation of Eccles.

The Bishop of London consecrated on Tuesday the new church of St. Cyprian, situate in Dorset-square, Marylebone. Designed by Mr. J. N. Comper, it is an example of 15th-century English Gothic. The internal walls are faced with Bath stone, and the roof is of pine with fibrous plaster panels. As it stands, the church has cost £13,000, and a congregation of more than 600 is accommodated.

Mr. William Foulis, C.E., gas-engineer to the Corporation of Glasgow, died on Sunday last at 2, Montgomerie-gardens, Glasgow, after a short illness. Mr. Foulis, who was seventy years of age, was the son of a former gas manager, of St. Andrews. In 1869 he was appointed gas manager to the Glasgow Corporation, and had effected many improvements in the works, including the construction of an apparatus, patented by him in conjunction with Sir William Arrol, for charging and drawing retorts, a contrivance widely adopted elsewhere, and which was said to save a shilling per ton on the cost of labour. Mr. Foulis leaves a widow and one son, who is an engineer.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—C. W.—E. S.—M. B.—M. and Son.—L. R.—O. E. A.—R. K. K.—N. and Co.—D. D.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Callabar," "All British," "Ogee."

Correspondence.

STANDARDISING BRICKS.

To the Editor of the BUILDING NEWS.

SIR,—In your last issue (p. 886) you give a report of the conference held at the Building Trades Exhibition to discuss the desirability, or otherwise, of formulating a standard of sizes for bricks. There seems to be a feeling on the part of some of the speakers that in the North of England very little interest would be taken in the movement.

As I am one who has been desirous for many years of seeing something like uniformity in this matter, I feel compelled to write and state that I am of the opinion that a large number of architects in the North would support the resolution carried at the meeting. I have myself for the last three years specified a uniform size of brick for facing common and glazed work to wall four

courses to a foot with joints. Thus I am enabled to obtain a thin wall with facings on one side, glazed the other, and filled internally with common bricks with a perfect bond, and saving any cutting or using of iron ties.

I have never found the builders raise any objection when my requirements have been clearly stated in the specification before tendering, nor have I had any difficulty with the brick-makers.

The standardising of the sizes of bricks rests with us architects far more than with the makers.—I am, &c., H. ASCROFT CHAPMAN.

Prudential Buildings, Park-row, Leeds,
June 30.

Intercommunication.

QUESTIONS.

[11981].—**Plaster of Paris.**—Can any of your readers recommend a book dealing with manufacturing and use of plaster and its combination?—G. W. KAPLER.

[11985].—**External Plaster.**—Are the white cements—Keeble's, Parian, Alcant, &c.—durable for external plastering between half-timber work? If so, is it the custom to use sand or port cement, or on a ground of Portland? Is there any other approved method of finishing external plastering a light colour without sacrifice of durability?—W. A.

[11986].—**Flats.**—In what year were flats first built in London, and where are some of the earliest buildings?—J. K.

[11987].—**Charges.**—What would be a fair and reasonable professional charge for making (1) general particulars and tracing of staircases for four proposed electrical passenger lifts and four dinner lifts? (2) Obtaining estimates (giving particulars personally to engineers, tendering)—highest tender £1,644, lowest tender £1,070?—B.

[11988].—**Australia.**—I am thinking of emigrating to Australia at the latter end of this year, chiefly from a health standpoint. I should not wish to be away more than twelve months, and, of course, should like to carry on my present employment, an architect and surveyor's assistant. I should be glad of any advice respecting conditions and advisability, also likelihood of obtaining a situation.—J. G. E.

[11989].—**Drift under Slatting.**—Is there any composition for covering slating to take the place of tar and sand (or tar and sand) less unsightly and equally effective?—J. E. C.

[11990].—**Plans and Specifications.**—When a building has been completed in accordance with plans and specifications prepared by an architect, and the usual commission paid for the use of them and superintendence, are they the property of the architect or the building proprietor?—A. M. R.

REPLIES.

[11982].—**Measurement of Plate-Glass, &c.**—Plate-glass and lead-lights should be measured from rebate to rebate, or extreme dimensions, and any part of an inch is reckoned as an inch in measuring. In billing plate-glass item state thickness and quality, and superficial quantity in a square, commencing with not exceeding 2ft. sq., and keeping each size separate, thus: 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 18, 20, 25, 30ft., and so on, &c. Also state if square, circular, or irregular shape, and keep separate, and describe how glazed. In lead-lights describe the lead: if in quaries, if bordered, the description of glass if lights are secured with copper wire or bands. Keep the parts in pointed or cusped heads or tracery work separate, stating that the same has been measured to the extreme points, and that it has been measured square.—R. E. GARDNER and SONS, Quantity Surveyors, 112, St. Peter's-road, Leicester.

[11982].—**Measurement of Plate Glass, &c.**—Unless it is stated in the bill of quantities, if any, that all measurements are "strictly net," all glass or lead-lights should be measured per foot superficial. The extreme dimensions being measured, whether of square, circular, or irregular shape, any part of an inch is called lin. in measuring. It is usual to state in the quantities that all glass is measured square, such as cusped or pointed heads, tracery, &c.—CHAS. MACKENZIE, Bury.

The London County Council Technical Education Board propose to take over the Camden School of Art, Dalmeny-avenue, Holloway, which is described as "one of the largest and most successful of the schools of art carried on in London under the auspices of the Board of Education."

At the East Ham town-hall, on Tuesday, a marble bust of the late Elizabeth Fry, the well-known philanthropist and advocate of prison reform, given to the district by Mr. J. Passmore Edwards, was unveiled by Mr. Sydney Buxton, M.P. Mrs. Fry lived for years in East Ham, where there are two memorials of her life-work—the church of St. Stephen, in Green-street, Upton Park, erected in 1837, and the Primitive Methodist Church, also at Upton Park, erected in 1833. The bust is of white marble on a tall pedestal, and it depicts the lady in the Quaker bonnet of her period. Mrs. Fry lived for 29 years in the White House, in Placket-grove, which building is now practically the only relic of the 18th century still existing in East Ham.

PARLIAMENTARY NOTES.

ORDNANCE SURVEY MAPS.—In reply to Mr. Kennedy, Mr. Long says:—The boundaries of parishes and baronies were omitted from the new issue of the 1in. Ordnance Survey Map in order to avoid confusion with other and more important details; but, on the other hand, a special edition of the map is now issued for local government purposes, on which the boundaries of rural and urban districts, and also those of counties, district electoral divisions, and county boroughs are shown in red. Any question which may arise as to the old boundaries of parishes and baronies could always be settled on reference to the copies of maps of the old edition, which are retained by the Ordnance Survey.

DATES FOR COMPLETION OF PUBLIC BUILDINGS.—Mr. J. Ellis asked in the House of Commons on Friday what were the dates fixed by contract for the completion of the various public buildings in Whitehall, Parliament-street, and South Kensington, and was such progress being made with the respective contracts as to insure their readiness for the public service by the specified dates. Mr. Victor Cavendish replied:—In answer to the first part of the question, the dates for the completion of the contracts for the fabrics of the respective buildings are as follows:—New War Office, June 26, 1905, new Public Offices in Parliament-street, June 1, 1907, Royal College of Science, June 1, 1905, Victoria and Albert Museum, February 23, 1907, Admiralty (Block III.) (say) June 30, 1906. (Contract about to be made for superstructure.) With regard to the second query, I have to say that such progress is being made with the above works as to justify an assumption that they will be completed by the specified dates. In some cases it is possible that the fittings will not all be finished; but every effort will be made to avoid delay.

CHIPS.

On the occasion of the retirement of Mr. T. E. Tiffin, A.M.I.C.E., P.A.S.I., from the position of deputy borough engineer of West Hartlepool, to take up the appointment of engineer and surveyor to the Urban District Council of Dartford, he was the recipient of a service of silver plate presented as a token of the regard in which he is held by his colleagues.

The annual Government Report on Indian Railways, published this week, states that in the three years 1900-2 2,379 miles of open line have been added to the railway systems. Subsequent additions up to May 1 last have brought up the total mileage of Indian railways to 26,561, of which 14,316 miles are on the standard 5ft. gauge and 11,247 on the metre gauge.

Mr. W. A. Dacot, an inspector of the Local Government Board, has held an inquiry at Sheffield into an application of the city council for sanction to borrow £8,938 for Eyre-street extension.

The provisional order obtained by the urban district council of Rumbottom, Lancs. from the Board of Trade for the construction of tramways 5½ miles long has passed the committee of the House of Lords. The estimated cost is £60,000.

Mr. J. B. Peace, M.A., Emmanuel College, Cambridge, has been appointed University Lecturer in Mechanical Engineering for five years from Midsummer, 1903.

The London County Council resolved on Tuesday "That, having regard to the urgent need of healthy dwelling accommodation for working people, it be referred to the Housing of the Working Classes Committee to consider the desirability of putting into operation section 59 (part III.) of the Housing of the Working Classes Act, 1890, which gives power to acquire 'existing buildings,' and to 'alter,' 'enlarge,' 'improve,' and 'convert' the same into dwellings."

The members of the Scottish Ecclesiological Society visited Linlithgow on Saturday. They were shown over St. Michael's parish church by the Rev. John Ferguson, minister of the parish, who explained its architectural features. After dinner the company proceeded to Dalmeny Church, and subsequently visited other ecclesiastical antiquities in the neighbourhood.

The parish church of Tavistock was reopened on Saturday after restoration at a cost of £1,500. Mr. G. H. Fellowes Prynce was the architect, and Mr. J. A. Dennis, the builder.

A bronze statue of the late Mr. R. Ascroft, M.P., was publicly unveiled in Alexandra Park, Oldham, on Saturday afternoon. The cost of the memorial has been defrayed by public subscription.

The Ferryhill section of the Aberdeen Corporation Tramway system was opened on Friday. It has been completed from Crown-street to the top of Whinnhill-road. The portion from Whinnhill-road to the railway bridge is at present in course of construction, and when finished the entire route will be about one mile long. The cost of the work has been £15,000.

WATER SUPPLY AND SANITARY MATTERS.

BIRMINGHAM.—The means to relieve the Rea main sewer in order to obviate floods in the Sherlock-street district has been reported upon by the Public Works Committee of the City Council. They state that the serious flooding of property in Sherlock-street, Longmore-street, Digbeth, and the adjoining low-lying districts, occasioned by the overcharging in times of storm of the Rea main sewer, has occupied their attention for some years. The city surveyor Mr. John Price, has made a thorough investigation into the condition of the sewer, as to its capacity to meet the demands of the extremely low-lying lands draining into it during heavy rainfalls, and also as to its condition structurally. As a result he has recommended the carrying out of extensive works to remedy the present evils. It is proposed to relieve the main sewer by the construction of a system of storm-water sewers carried from the River Rea to meet each incoming branch main at such a level that the discharge is not affected by the rise or fall of the river in flood times. In certain portions of the low-lying districts it has not been found possible to adopt this system, but a system of surface-water sewers has been included in the scheme to deal with such districts. The latter scheme will take all front roof water. The city surveyor estimates that the cost of the construction of the overflows and the surface-water drainage will amount to £48,000, in addition to £2,400 for the diversion of Hope-street sewer. The committee recommend further expenditures of £1,250 for the diversion of the Salfley outfall sewer and £1,200 for a surface-water culvert in Somerville-road. The work of widening, deepening, and otherwise improving the River Rea at Nethells has been before the council on many occasions during the last fifty years, the council having at various times carried out portions of the improvement at a capital cost of £60,000. The only important length of the river not yet dealt with is that lying between a point a short distance above Erskine-street and the sewage disposal works at Salfley. In the opinion of the committee, the time has arrived when the improvement should be continued for that portion between the commencement of the Gas Committee's lands to the outfall of the millrace near the sewage disposal works. This improvement involved the purchase of the water rights of Mr. Wills, at Park Mills, who is willing to dispose of his water rights and about six acres of land for £12,600 and costs. The Corporation have been advised by Messrs. Mansergh and Sons and the city surveyor that this is the only effective course to pursue. The committee therefore recommend that they should be authorised to accept Mr. Wills's offer.

COLCHESTER.—The newly-completed system of sewage disposal for the borough of Colchester was officially inaugurated on Wednesday week. The original works were constructed in 1883, and opened in 1884—a year rendered memorable locally by an earthquake. The success of the appliances then used for the disposal of Colchester sewage was a matter of constant debate, and at length the general officer commanding the eastern district threatened the corporation with an injunction. Chemical treatment of the sewage was adopted in 1886, and carried on with uniform success; but the plant being insufficient for a rapidly increasing population, the town council resolved to extend and enlarge their works, and adopt an improved treatment of sewage. It was decided to adopt the tank system with bacteria beds of breeze for purifying the liquid, and the result has been the discharge into the river of what is claimed to be an absolutely innocuous effluent. The solid deposits in the tanks are forced by machinery into a press-house, where they are condensed into sludge, which is sold for manure. Four additional tanks, holding a total of 836,000 gallons, have been recently constructed for the reception of the crude sewage, and with the four formerly existing, the total tank capacity is equal to 1,436,000 gallons. Near the tanks are six newly-constructed filter-beds, and the mode of working provides for each filter-bed being at rest for some eighteen hours after the liquid has been drawn off from it. The breeze which forms the purifying material is laid on concrete floors, and is about 4ft. deep. On emergency, it is possible to charge these beds with a total of two million gallons per day, the average amount of sewage dealt with at the works being at present about 900,000 gallons daily. The recent additions to the sewage plant, &c., include a new press-house and engine-house, two new sludge-presses, hydraulic closing gear, pneumatic forcing receivers, and a storage receiver. The work has been carried out by the borough surveyor, Mr. H. Goodyear, at a cost of £9,692, the estimated cost being £10,000.

A Wesleyan chapel at St. Martin's, West Corn-wall, was opened last week. It has cost £1,300, and accommodates 376 persons. Mr. John O. Eva, of Helston, was the architect, and Mr. W. T. Cooke, of Mawgan, the contractor.

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NEW PREMISES IN PICCADILLY.—SCOTTISH UNION AND NATIONAL INSURANCE OFFICES, BIRMINGHAM.—SECOND PREMATED DESIGN FOR CAPE OF GOOD HOPE UNIVERSITY.—SECOND PREMATED DESIGN FOR NEW PUBLIC OFFICES, PONTYPRIDD.—HOUSE AT KELHAM, NEWARK.—RECENT ADDITIONS TO THE SOUTH KENSINGTON MUSEUM.—LIVERPOOL CATHEDRAL: SELECTED DESIGN.

Our Illustrations.

NEW PREMISES, PICCADILLY.

No particulars of this new block of premises in Piccadilly have reached us.

NEW OFFICES OF THE SCOTTISH UNION AND NATIONAL INSURANCE COMPANY, COLMORE ROW, BIRMINGHAM. Our illustrations this week include a view of the front of the above and a plan of the ground floor, the whole of which is occupied by the insurance company, together with a mezzanine over a part of it. The upper floors, let out as offices, are approached by a circular staircase with a passenger lift in the staircase well. The Colmore-row front is to be built of grey granite, with a finely axed face, so far as the lower story is concerned, above which the front is continued in Portland stone, with bands of red brick. The lower part of the large dome is covered with green Westmoreland slating—its upper part and the smaller domes being in lead. It is to be feared that for some time to come certain rights of light temporarily held by adjoining properties will prevent the building rising to the height contemplated and shown by the view we publish. Messrs. Henman and Cooper are the architects.

CAPE OF GOOD HOPE UNIVERSITY: SECOND PREMATED DESIGN.

We illustrated the selected designs for these buildings on May 29 last, and gave a view, with plans, of the third premated design also at the same time. We now show the second prize scheme submitted by Mr. J. Edwin Forbes, whose plan is quite different to that placed first. It is a straightforward and well-arranged building. The coloured view submitted in the competition was too highly tinted to come out really well, and to do this reproduction as satisfactorily as we have managed it, time was needed. The boldly projecting cornice casts a deep shadow, adding a suitable effect to the façades for its position, though otherwise the detail is somewhat uninteresting. The loggia and corridors below would help to keep the hall cool.

PUBLIC OFFICES, PONTYPRIDD: SECOND PREMATED DESIGN.

MR. S. D. ADSHEAD, the author of this prize design, says that he has nothing of special interest to say by way of description. Red brick and stone were intended, and the detail shows the type of design adopted. We gave elevations and plans of the selected scheme in the BUILDING NEWS for May 22 last.

HOUSE AT KELHAM, NEWARK.

THIS house, now in course of erection, is built of Kelham red sand-faced bricks with stone copings.

The roofs are covered with Hurlhill hand-made tiles. The drawings here reproduced are exhibited in this year's Royal Academy. Mr. Harold Bailey, A.R.I.B.A., of Newark, is the architect, and Mr. William Smith, of Newark, is the contractor.

RECENT ADDITIONS TO THE SOUTH KENSINGTON MUSEUM.

THROUGH the benevolence of well-disposed persons the fine collection of art treasures at the South Kensington Museum is from time to time still further enriched. Amongst the later additions is the Woodcroft bequest, consisting of some excellent specimens of Late 17th-century Chairs. The two chairs shown in the sketches are of oak and walnut wood respectively, with high back of scroll design and fittings of cane. The arms in both instances are scroll-shape, the legs are turned and tied together with stretchers; the oak chair has the addition of a scroll in front, with velvet seat, and fringed. The seat of the walnut chair is of cane. The cupboard stands about 5ft. high, 4ft. 6in. wide, by 1ft. 6in. deep. The whole front is divided into six panels, with door in centre; the panels are moulded and carved out of the solid. The hinges are of wrought iron, the handle of more recent date. This cupboard is also of oak.

LIVERPOOL CATHEDRAL: SELECTED DESIGN.

THIS transverse section through the nave of the cathedral shows the side elevations of the towers and of the so-called transepts, or, more properly speaking, gabled dormers, which divide the nave longitudinally into compartments, shown by the section given in the BUILDING NEWS for June 12. Last week we illustrated the two end elevations of the building, and the plan and main side to St. James-road appeared in our issue for May 29. Mr. G. Gilbert Scott and Mr. G. F. Bodley, R.A., are the joint architects.

CHIPS.

We regret to learn of the serious illness of Mr. Greville C. Hems, son of Mr. Harry Hems, of Exeter. Mr. Hems, who is suffering from a painful complaint, has undergone an operation, but is still in a serious condition.

A new folding map of the Republic of Peru, on a scale of forty miles to the inch, with a short description of the country—its features, resources, and means of communication—has just been published by Don Eugenio Larrabure y Unzué, the Minister for Foreign Affairs, and may be obtained of Mr. Edward Higginson, Canute-road, Southampton, the Consul for Peru. An inset map of England and Wales to like scale enables one to grasp the vast area covered by this thinly-populated territory.

A second section has been added to the Church of St. John at Gainsborough, and was dedicated last week by the Bishop of Lincoln. The first portion was built in 1881-2, from plans by Mr. J. T. Micklethwaite, F.S.A., of Westminster, and consisted of six bays of the nave and chancel, but without the clerestory. Three more bays have now been added to the nave, also from Mr. Micklethwaite's designs, and the church now seats 800 persons.

The Ordnance Survey have recently published a folding pocket map of Glossop and the surrounding district on the scale of one inch to the mile. The map is printed in colours on sheets 18in. by 12in., mounted on canvas, in a cover. It is in outline with contours, the hill features being printed in brown. It includes the two routes over the Pennines from Mottram to Penistone and from Greenfield to Holmfirth, Glossop just coming into the south-west corner of the map. Unfortunately, every country road paved with setts, however bad, is marked first-class, there being little discrimination as to the character of the surface from the cyclist's or driver's viewpoint.

Messrs. Andrew Handyside and Co., Ltd., of Derby and London, have obtained the contract for the supply of two swing-bridges for the Cardiff Railway Company. One bridge will carry two lines of rails and two roadways over the communication passage of the South Dock, Cardiff, and the smaller bridge will carry a single line and one roadway over the entrance lock.

MR. J. C. Inglis, the chief engineer, has been appointed the general manager of the Great Western Railway, in succession to the late Sir Joseph L. Wilkinson.

A receiving order has been made in the case of Walter George Brown (formerly carrying on business under the style or firm of G. Brown and Son, and latterly as Walter G. Brown), Leicester, contractor; and also in that of Joseph Molyneux, St. Helens, Lancashire, builder.

STATUES, MEMORIALS, &c.

ADELAIDE, S.A.—Captain Adrian Jones has been invited to execute for the people of Adelaide an equestrian memorial to the contingent which, going from that city as part of the Australian force, rendered good service during the war in South Africa. The sculptor has chosen as his subject a member of the Adelaide Contingent engaged as a scout, and the trooper is depicted in the act of suddenly reining in his charger as he sights the enemy across the rocky veldt. The whole figure stands 11ft. 6in. high. Next week the plaster cast will be removed to Thames Ditton, there to be cast in bronze, and when the memorial has been completed, it is to be shipped to Adelaide for erection upon a granite pedestal in one of the public squares of that city.

THE WELLINGTON MEMORIAL IN ST. PAUL'S.—A further stage towards the completion of the Wellington Monument in St. Paul's Cathedral has now been reached, Mr. Tweed's model of the equestrian statue which is to surmount the whole having arrived within the building. During last week workmen were engaged in erecting a scaffolding in the north-west bay adjoining the monument, and when the plaster model was brought to the Cathedral it was hoisted on to a lofty platform on a level with the summit of Alfred Stevens's marble and bronze memorial, to be transferred thither when the preparations for its reception are completed. There this work of Mr. John Tweed, the sculptor, commissioned by the committee to complete the monument, and based upon Stevens's model, long stowed away in the Cathedral crypt, will remain for the public to judge of its effect before it is finally cast in bronze.

At the last meeting of the city council of Exeter, a letter was read from Mr. James Jerman, F.R.I.B.A., of Bedford-circus, a member of St. David's Ward, resigning his seat in consequence of his position as architect to the Exeter School Board. He inclosed five guineas. A resolution was adopted declaring the vacancy. Messrs. J. A. Loram, A. T. Oliver, J. Stocker, E. C. Perry, W. Wreford, and the Mayor joined in the regret at Mr. Jerman's resignation, and it was decided to enter a record of his services in the minutes.

The pavilion and concert-hall at the seaward end of Cleethorpes pier, together with a considerable portion of the pier itself, were destroyed by fire on Monday. The structural damage done exceeds £5,000, and the season's takings are also, of course, lost.

In connection with the improvements at the Port of Dover for shortening the cross-Channel passage, two new electric cranes have just been installed. These cranes, the equipment of which has cost £11,000, have been constructed to the design of Sir William Preece and Messrs. Siemens. They command both sides of the Admiralty Pier, and have involved very large structural additions. The cranes are to be used for the transhipment of mails and baggage in specially-built crates capable of containing 2½ tons. Under the new system, which came into operation on July 1, coincident with the advent of the turbine steamer, a great saving of time is effected. Electrical cranes have also been erected at Calais, and the mail steamers have been specially altered for the shipping of the crates.

A large new clock has just been erected upon the church tower, Beadnell, Northumberland, in commemoration of the Coronation. Messrs. John Smith and Sons, Midland Clock Works, Derby, have carried out the work, and they are also just completing a similar clock for Colnbrook, near Windsor.

The formal opening of the new buildings on the hills above Faugbonnre, to which Clayesmore School has moved from Enfield, took place on Saturday. The Clayesmore estate is over 200 acres in extent, and, including the schoolhouse, has been acquired for the school by a limited liability company, the purchase price being £30,000.

On Thursday last week the new reredos which has been placed behind the holy table of the Lady-chapel of St. Petros Church, Little Petherick, was dedicated. It has been given as a memorial to the late rector, the Rev. H. S. Barker. The reredos was carved from the drawings of Mr. J. N. Comper, of London, and contains figures of the Blessed Virgin and Holy Child, SS. John the Evangelist, Petros, Francis of Assisi, and Antony of Padua. It is richly coloured and gilt.

The first school completed under the auspices of the city corporation of Bristol was opened on Monday night. It is a junior mixed institution in Mina-road, and has been built from plans by Mr. H. Dare Bryan, of Bristol. Mr. George Humphries having been the contractor. The total cost was £8,228.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £166,035. For the corresponding week of last year the sum was £30,720.



ELEVATION

NEW
PUBLIC OFFICES
PONTYPRIDD

SECOND PREMIAED DESIGN

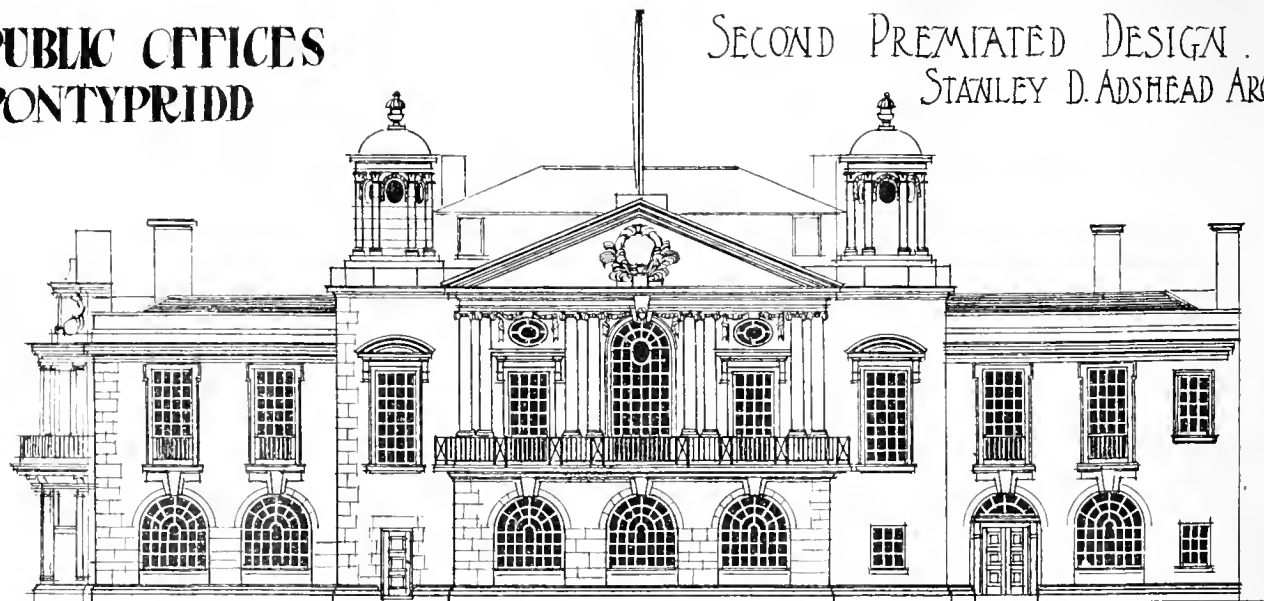
S. D. ADSHEAD
ARCHT

*Detail of
Main Entrance*

PLAN
at Ground floor

PLAN
at first floor

SECOND PREMIAED DESIGN.
STANLEY D. ADSHEAD ARCH^t



A detailed floor plan of the first floor of the National Theatre. The central feature is the 'THEATRE' (auditorium), which is semi-circular with tiered seating. To the left of the theatre is the 'LOBBY' and a 'CLOAK ROOM'. Above the lobby is the 'COMMITTEE ROOM'. To the right of the theatre is the 'STAGE' area, which includes a 'STAGE BOX' and a 'STAGE' area. Further right are the 'EDUCATION' and 'GENERAL' rooms, and a 'PRIVATE' room. At the top of the plan are the 'CLERK' and 'CLERK' rooms, the 'THE COUNCIL' and 'DEPUTY CLERK' rooms, the 'DEPARTMENT' and 'CLERICAL OFFICE' rooms, and the 'STAFF' and 'LAVATORY' rooms. The plan also shows various corridors, stairs, and smaller rooms like 'TOILET' and 'W.C.'.

A detailed floor plan of the interior of the Lincoln Barracks. The plan shows a central corridor with rooms on either side. The rooms are labeled as follows:

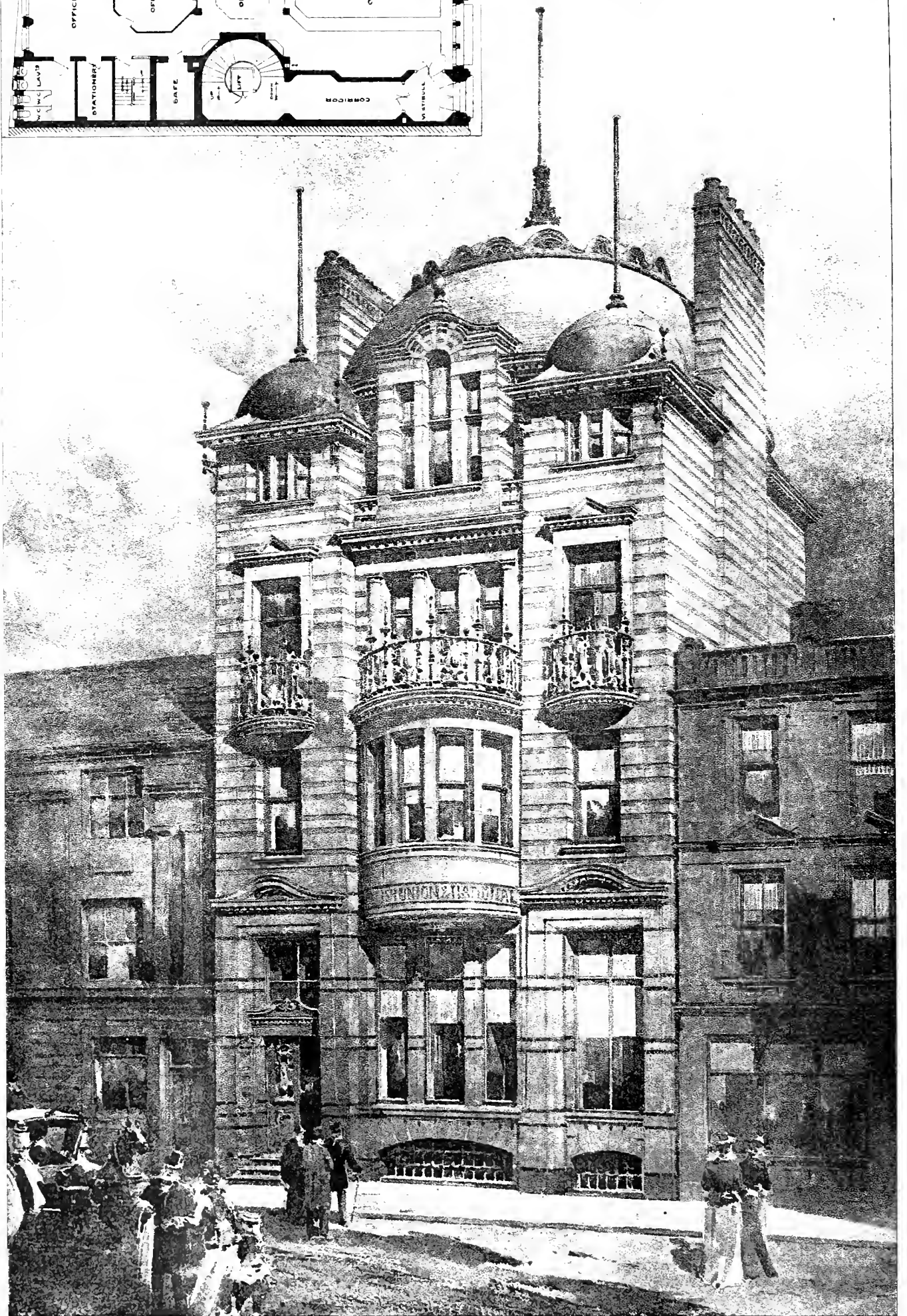
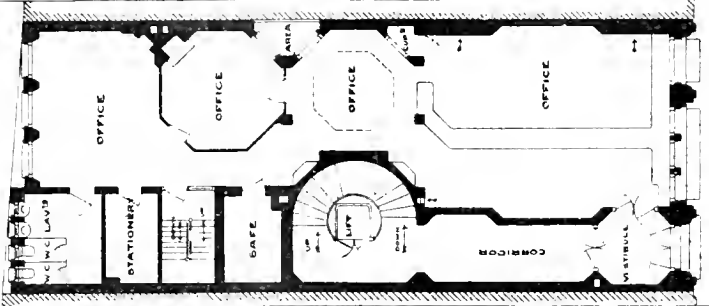
- ON SUBJECTS PRIVATE
- THE PUMP GENERAL
- STORES ROOM
- DEBARS OFFICES
- GAS CHAMBER
- DEPART SERIAL
- STAFF LAVATORY
- ENTRANCE
- SERIAL BOARD
- MEDICAL OFFICE
- SURRENDER OF RESERVES
- TRAINWAY GENERAL
- DEPART MANAGER
- KITCHEN

The plan also shows several smaller rooms and a large central hall.

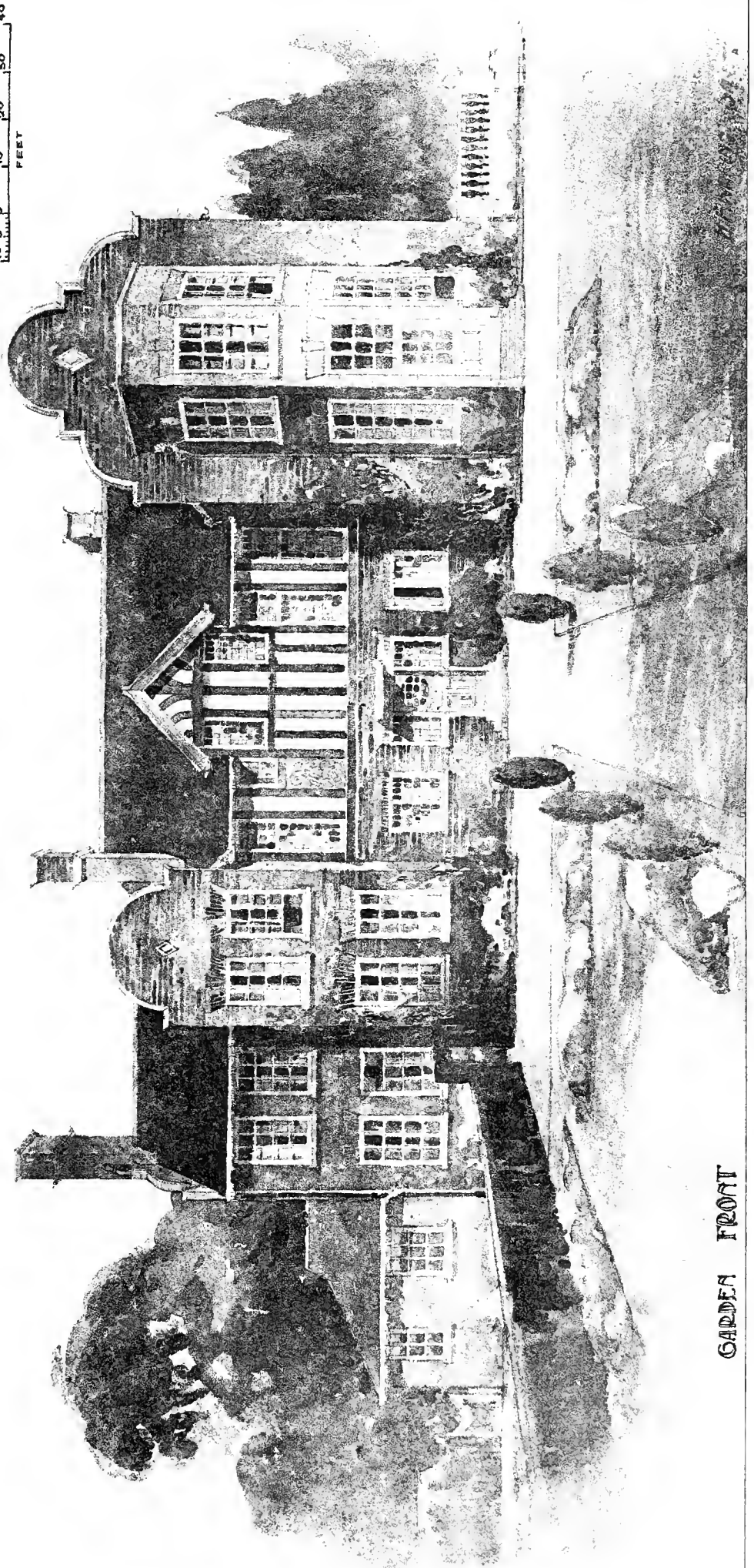
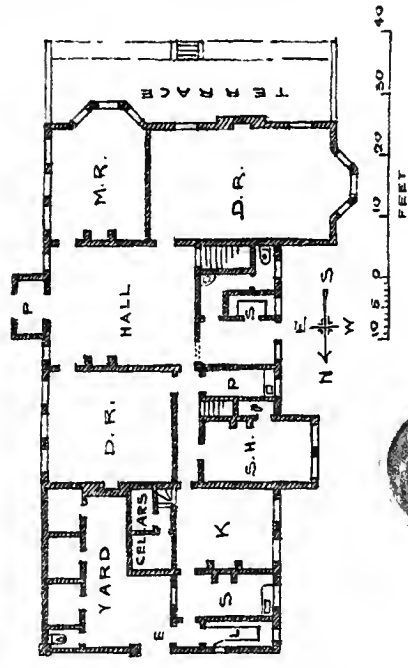
Photo Lithographed & Printed by Jasmer Akerman, 5, Queen Square W C



SCOTTISH UNION AND NATIONAL INSURANCE CO.
NEW OFFICES - COLMORE ROW - BIRMINGHAM



HOUSE AT KILHAM, NEWARK
FOR H.A. SUTTON ESQ.
HAROLD BAILEY ARCHT.

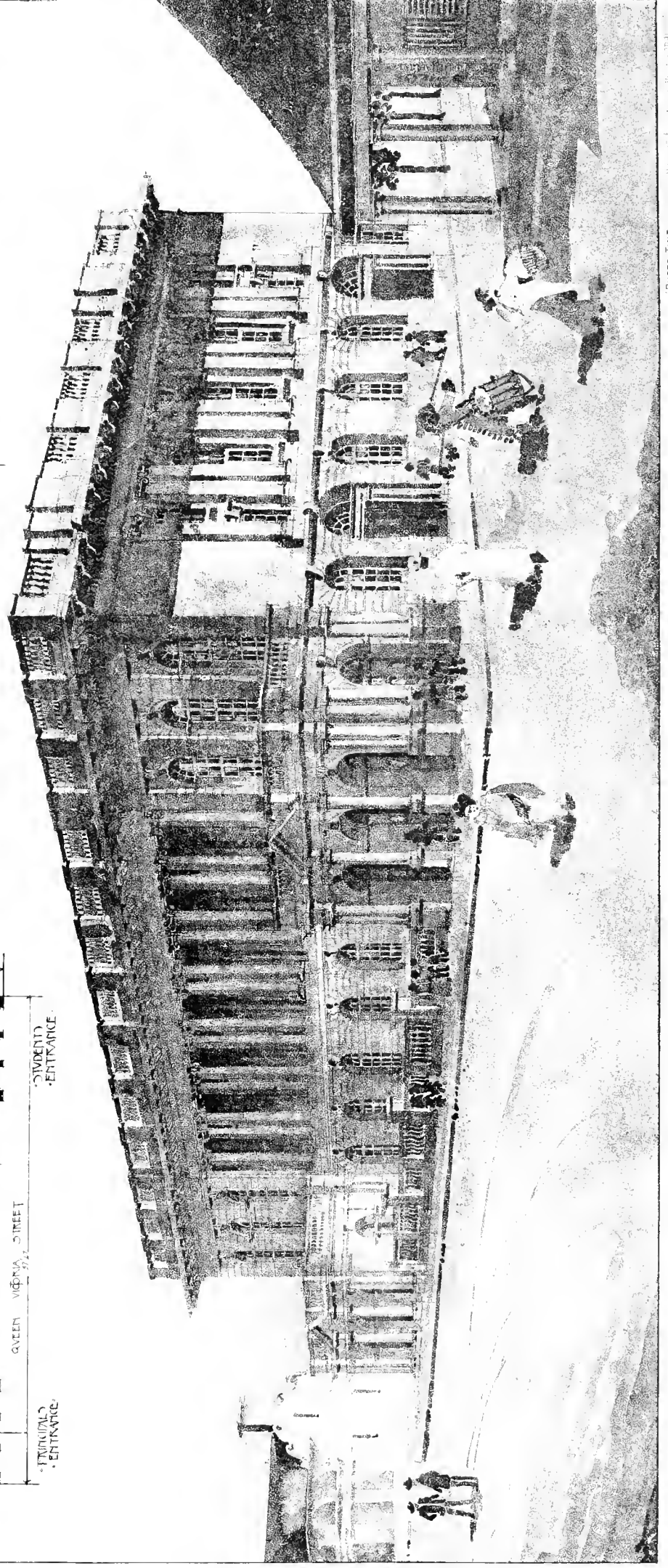
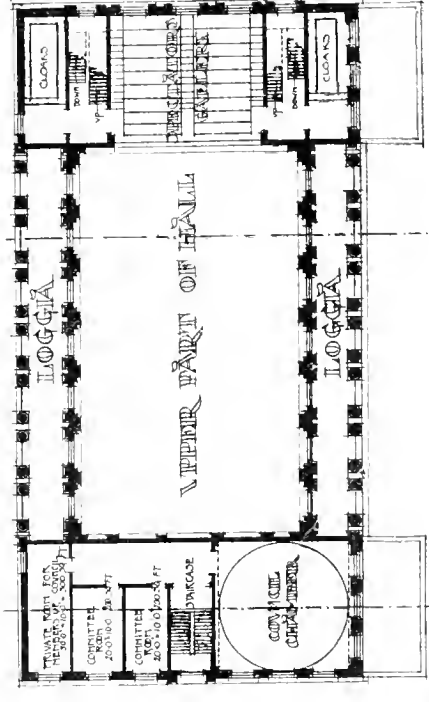
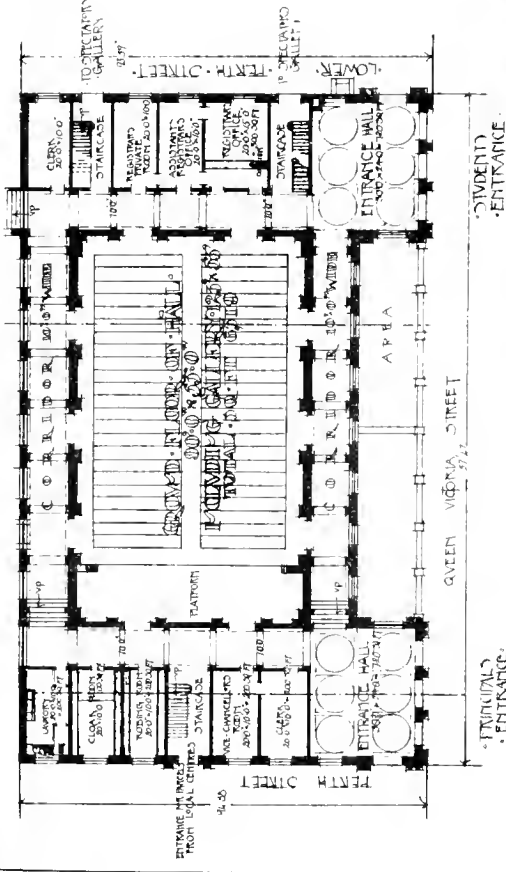


GARDEN FRONT

CAPE OF GOOD HOPE.
UNIVERSITY

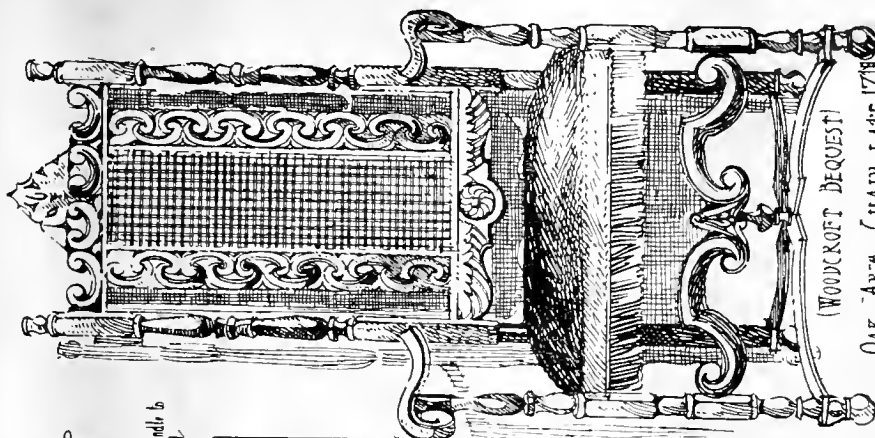
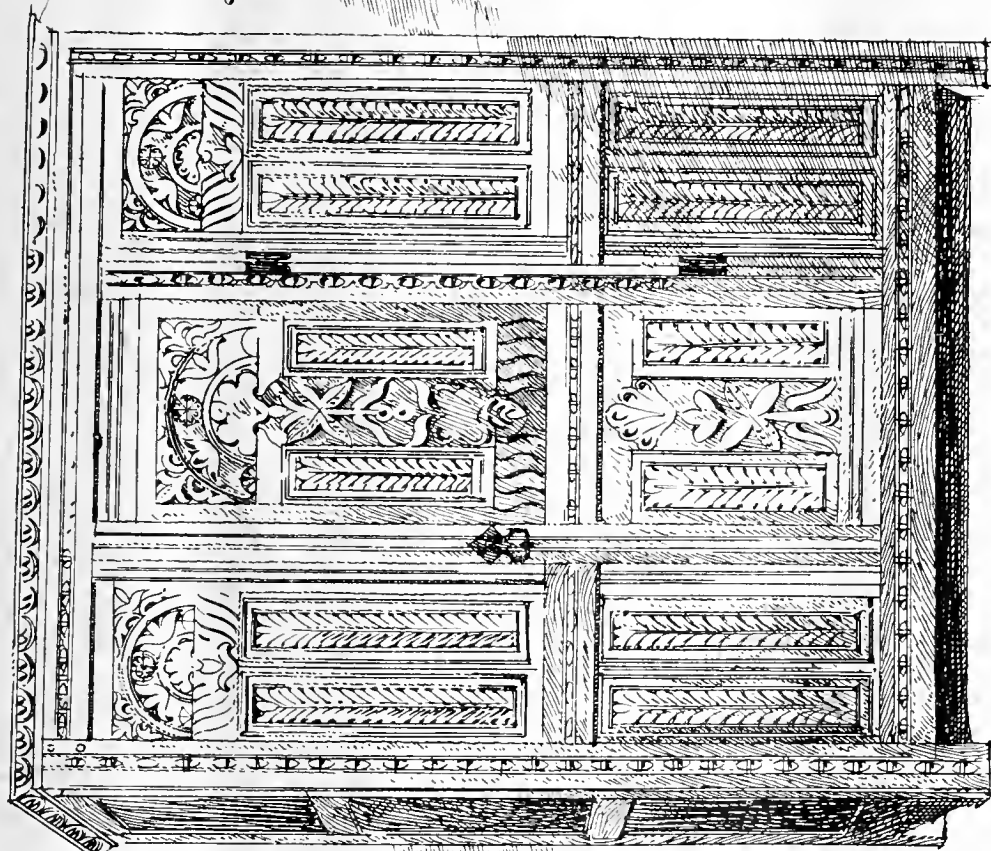
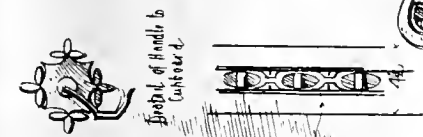
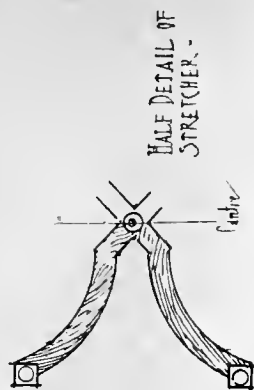
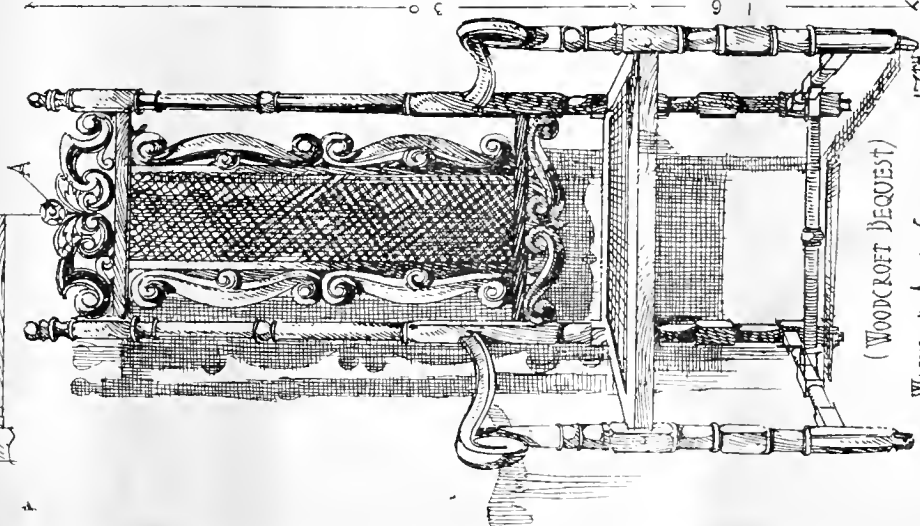
SECOND PREMIATED DESIGN.

J EDWIN FORBES. ARCHITECT





RECENT ADDITIONS TO THE SOUTH KENSINGTON MUSEUM.



W. J. WILKINSON
18

LEGAL INTELLIGENCE.

NIDD VALLEY ARBITRATIONS.—Lieut.-Colonel W. H. Wellsted, C.E., the umpire in the matter of *T. E. York v. The Bradford City Corporation*, has just issued his award, amounting to £15,708. The claim was in respect of 848 acres of freehold land in the Nidd Valley taken for the construction of the Angram Reservoir, and the mineral rights and sporting over other 6,031 acres, and amounted to £70,696, whilst the value placed upon it by the corporation witnesses was £7,470. The arbitrator for the claimant was Mr. Thos. Fenwick, C.E., Leeds, and the witnesses were Messrs. C. R. Fenwick, W. B. Boord, John Maugham, Richard Horsfall, W. F. Tempest, and John Farrah. The arbitrator for the Bradford Corporation was Mr. Chas. Gutt, C.E., Bradford, and the witnesses were Messrs. Fredk. Fowler, W. B. Woodhead, R. B. Broster, and George Runtun.

"SUPERPOSED SEMI-DETACHED RESIDENCES."—*THE ILFORD PARK ESTATES (LIMITED) v. JACOBS.*—Mr. Justice Swinfen Eady has given judgment in a motion by the plaintiffs for an injunction to restrain the defendant, her servants, agents, or workmen from erecting on certain lots in Brisbane-road, Ilford, Essex, more than one house within the meaning of a covenant contained in a conveyance dated November 14, 1898, and made between the plaintiffs and the defendant, or any house of less value than £300, or any building whereof the elevation had not been approved in writing by the plaintiffs' surveyor upon any one of the lots. By the conveyance in question the plaintiffs conveyed to the defendant certain hereditaments and premises forming part of the Ilford Park estate at Ilford, on the east side of, and having a frontage to Brisbane-road of 51ft., and shown on a plan and numbered lots 563, 564, and 565. The conveyance contained a covenant by the defendant to observe, perform, and abide by all the stipulations contained in the schedule thereto so far as they related to the premises thereby conveyed. The schedule, by clause 2, provided that no trade, business, or manufacture should be carried on upon any lot except those lots fronting Ley-street. Clause 3, which provided as to the value of the buildings to be erected, was as follows:—"No house shall be erected fronting any road of less value than stated in the schedule hereunder, the value to be calculated at net prime cost exclusive of the land. Not more than one house shall be erected on any lot." Then, as regarded Brisbane-road, the minimum value was stated to be £300 each house. Clause 10 provided that no building should be erected on any part of the land save where the elevations had been submitted to and approved in writing by the plaintiffs' surveyor, and a copy of the design deposited with the surveyor. It appeared that the defendant, intending to erect certain buildings, submitted first of all an elevation and then an amended elevation of the proposed buildings to the plaintiffs' surveyor, which the latter refused to approve. No elevation had, therefore, been approved as required by clause 10. The buildings were to consist of two floors. On the ground-floor was one complete tenement with its own front door. On the upper floor was another complete tenement. Access to the upper floor was obtained through a separate front door opening on a staircase, which was divided by a brick wall from the ground-floor tenement. The two front doors were side by side, set back in an archway. The plaintiffs' surveyor alleged that these buildings, which the defendant was now proceeding to erect, were a breach of the stipulation contained in clause 3 of the schedule. Mr. Justice Swinfen Eady, in giving judgment, said the question was whether the defendant was committing a breach of the covenant contained in the deed of November 14, 1898. The contention on behalf of the plaintiffs was that the defendant was putting up on one lot two houses which were separated horizontally and not vertically. It was not disputed that, if the defendant were erecting two semi-detached houses vertically separated, they would constitute two separate houses, but it was contended that the building was in reality only one house. There was no internal communication between the ground floor and the first floor; there was no common staircase, as the ground floor did not require a staircase; and there was no common front door, but separate front doors for each of the two tenements. In order to pass from one house to another it was necessary to pass out of the front door of one tenement to a space which opened upon the street and to enter the front door of the other. The language in which Lord Brampton in "*Grant v. Langton*" (1900) described the building there in question was exactly appropriate to describe the building in the present case. At page 399 he said: "One roof covers the whole building, but each story is so structurally completed and arranged for permanent occupation by a separate occupier that there is no internal communication of any kind between the two stories, nor any common staircase or access to or from the street, or from any part of the outside of the premises, each having a separate entrance or entrances therefrom. In short, it would be im-

possible to erect two separate houses under one roof or to divide one building into two distinct and separate houses more completely than has been accomplished in the building now under consideration." Now, the question was whether each of these buildings constituted one or two houses. On the one hand, reference was made to the cases of blocks of flats. The first case was that of "*Kimber v. Admans*" (1200), before Mr. Justice Cozens-Hardy and the Court of Appeal, where the defendant had erected blocks of flats on the plots purchased by him subject to similar restrictions to those in the present case. There it was contended that each flat in a block of flats was a separate dwelling-house; but Mr. Justice Cozens-Hardy held that each block of flats constituted only one house. He said: "That which it is proposed to erect seems to me to be a house of the value of more than £500, and none the less a house of that value because it is proposed to be used as a series of flats." On the other hand, reference was made to "*Rogers v. Hosegood*" (1900). There was no question here of one house being built and being intended to be used as two. In substance there were here two houses structurally separated in every respect, with separate doorways into the street, and with no internal communication. It was different from the case where a building was erected and intended to be used for flats. In that case there was internal communication. Here there was none. It appeared to his Lordship that there was here merely one house superposed upon another house and divided horizontally. It was stated that with certain modifications of the plans the building could be converted into flats. Whether that could be done or not was not for his Lordship to say. In his Lordship's judgment each building constituted two separate houses, and was a direct breach of the covenant in the deed of November 14, 1898. There would, therefore, be an injunction in the terms of the notice of motion.

"WALNUT" FURNITURE.—His Honour Judge Parry had before him at the Salford County-court, on Monday, a case in which the question to be decided was whether or not a bedroom suite of furniture was of the description and quality represented at the time it was purchased. The plaintiff was Philip Hart, trading as Philip Hart and Company in Oldham-street, Manchester, as furniture dealer, and the defendant was William Greenwood, of Tenerife-street, Higher Broughton. The plaintiff's case was that he sold part of a bedroom suite to the defendant, who, however, wished to send them back, being dissatisfied because it was not entirely of walnut. Plaintiff contended that it was the universal custom of the trade to give the description of walnut to goods which had a walnut exterior, but were constructed of other woods in the inside portions. It was stated that the cost of the furniture had been walnut throughout would have been £80 or £70, and the cost of that sold to the defendant was £15 18s., which was the amount claimed in the action, the defendant having refused to pay. The defendant stated that the pieces of furniture which he saw at the plaintiff's place and purchased were secondhand, but the goods sent to him were not the same. The plaintiff guaranteed them to be of solid walnut, but they were actually made of four different woods. Defendant was of opinion that the outside of two stands were the same as he purchased, but different drawers had been put in. Judge Parry, in giving judgment for the defendant, commented strongly on the trading methods of some furniture dealers. If goods of such description were labelled "solid walnut," the sellers would be liable to prosecution under the Merchandise Marks Act for using fraudulent marks, and heavy penalties might be imposed. Some dealers did not seem to have learnt of the Act or of its principles, and he regretted that there seemed to be a certain section in the trade who would describe as walnut that which was a mixture of walnut outside and inferior woods inside. This, he thought, was nothing but a fraud, and the only reason for describing them thus must be to defraud the public and try to persuade them that they were buying something which they were not really getting. It was expressly to stop such practices that the Merchandise Marks Act was passed. Judgment was given for the defendant, with costs on the B scale.

RE GEORGE WILLIAM DORKING.—The debtor, a builder, of Kidderminster, came up for his adjourned examination at Kidderminster on Monday, before Registrar Talbot. His statement of affairs showed liabilities of £7,539, expected to rank £2,831, deficiency £911. Debtor was examined as to his building undertaking at Hill Grove-crescent. Questioned as to certain payments made to his wife, he said they were for household expenses. Debtor denied that he had kept books, a denial which the Registrar said he doubted. Debtor said there was a marriage settlement when he was married, and a draft was submitted to him, but he did not read it particularly. He admitted that some writing on the margin of the draft settlement was in his hand, which drew from the Registrar the remark that debtor said at the last examination that he never saw the settlement. Debtor: I never saw

the original. The Registrar said debtor swore he did not see the draft and did not know whether he had a life interest in the property under the settlement. Debtor said what he wrote on the settlement was at the dictation of his wife, and the trustee's solicitor said the effect of it was to give debtor a life interest in the property. The Registrar said he was very dissatisfied with the debtor's answers. Debtor denied that he had a considerable sum when he went away from Kidderminster, before the receiving order was made; he only had about £10. He was now living in London in the name of Templeman. The examination was adjourned for a fortnight.

RE HENRY PLASCOTT.—This debtor, whose examination took place last week, is described as of the Bargate Hotel, High-street, Southampton, licensed victualler, and trading at the Cattle Market, Southampton, under the style or firm of Plascott and Son, as contractors. The petition was filed by the debtor himself on May 30, the receiving order being granted, and the debtor was also adjudicated bankrupt. The alleged causes of failure are loss on contract now current in consequence of coming across unexpected springs and running sand, necessitating an expenditure of over £3,000 instead of £200, as estimated. The statement of affairs, as officially furnished, shows (in summary) a gross indebtedness of £11,237 7s. 1d., of which £11,062 13s. 4d. is expected to rank for dividend, the assets being set down at £5,862 13s. 2d., the deficiency being £5,200 0s. 2d.

CHIPS.

A Corinthian column of granite 105ft. high, surmounted by a bronze figure of Victory 12ft. high, standing upon a globe, the whole intended as a monument to Admiral Dewey, the figure by Robert I. Aitkin, and the architectural design by Newton J. Thorp, was unveiled in San Francisco during President Roosevelt's recent visit there.

The Duke and Duchess of Life visited Epsom on Wednesday for the purpose of opening the epileptic colony, which has been built on the Horton estate by the London County Council. The colony has been erected with the idea of the better housing, treatment, and employment of the insane epileptics from the asylums. The plans of the buildings, which are estimated to cost £93,000, were made by Mr. W. C. Clifford Smith (engineer to the Asylums Committee) in conjunction with Dr. C. H. Bond, medical superintendent. The colony stands on 112 acres of the Horton estate, on which the Manor Asylum with 700 females and the Horton Asylum with 2,000 patients have been erected by the County Council. The buildings comprise an administrative block and eight villas, in which provision is made for 266 males and 60 females.

Messrs. Newsum's soft wood sawmill, situate on Trent Bank, Gainsborough, was destroyed by fire on Wednesday night. The loss is estimated at £20,000. The mill, which measured 180ft. by 90ft., contained a quantity of costly machinery. Fourteen months ago works on the same site were burned, and the damage then amounted to £8,000.

The committee of management of the City Orthopaedic Hospital are carrying out considerable improvements and additions to the premises in Hatton Garden, consisting of new isolation ward, registration and consulting rooms, and nurses' cubicles. The architect is Mr. F. T. W. Goldsmith, A.R.I.B.A.

The new science block of St. Peter's school, York, erected at a cost of about £1,000, was opened on Tuesday by Dr. Allbutt, F.R.S., Professor of Physics in Cambridge University, an "old boy" of the school.

Mr. H. T. Steward, surveyor, Whitehall, has just issued his award as sole arbitrator in the case of *A. J. Russell v. the War Office*, an arbitration in respect of 92 acres of land at Plumstead, which the War Office have compulsorily acquired for the purposes of the extension of Woolwich Arsenal. The claim was for upwards of £10,000, and the arbitrator has now awarded the sum of £12,675.

Mr. William Collingwood, honorary member of the Royal Society of Painters in Water Colours, who was elected to the society so long since as 1855, but had been living in retirement for some time, died last week at his residence, Rosslyn, Abbotsford-road, Bristol, at the age of eighty-four. For 45 years Mr. Collingwood was a teacher of art at Liverpool, as well as practising the profession of an artist. He devoted himself in the earlier portion of his career chiefly to the reproduction of baronial and other interiors, and in his later years to Alpine landscapes. Forty years since he published a volume of lectures on "*The Value and Influence of Art in General Education*."

Mr. Robert Garnett, of Penketh, and of Messrs. Robert Garnett and Sons, of Warrington and Penketh, cabinetmakers, who died in April last, aged 73, left estate of the gross value of £81,907, with net personality £65,866.

Our Office Table.

MR. W. ALFRED GELDER, one of the new knights created in commemoration of the King's birthday, is the senior partner in the firm of Gelder and Kitchen, architects, Hull, and is a Fellow of the Royal Institute of British Architects and of the Surveyors' Institution. Sir Alfred Gelder has been intimately associated with the municipal life of Hull for a long time, and he is now enjoying the very rare distinction of filling the mayoral chair for the fifth year in succession. He is the first citizen during the last 600 years to be mayor of the old port for five years without a break. Sir Alfred is a comparatively young man, and his labours as a member of the corporation have been chiefly directed to the wiping out of slum property and the creation of new streets. The improvement of Hull in this respect during the last few years has been remarkable, and it is to the credit of the new knight that he has taken a very prominent part in bringing about the much-needed improvements. The new street upon which the proposed new municipal buildings for Hull are to be erected is named after him. The King has also conferred the companionship of the Imperial Service Order upon Mr. Henry Tanner, F.R.I.B.A., F.S.I., the principal architect of H.M. Office of Works, and upon Mr. Robert Cochrane, F.S.A., F.R.I.B.A., of Dublin, principal surveyor under the Irish Board of Works. The following letter was sent to Downing-street in reply to one from the Prime Minister:—"5, Orme-square, Bayswater, W., June 24. Dear Mr. Balfour,—I beg to acknowledge the receipt of your letter of yesterday wherein you say that the King has graciously signified his intention to confer on me the honour of knighthood on the occasion of his birthday, and for which I feel greatly thankful. Possibly his Majesty may not be aware that the Queen, his mother, graciously offered me a similar distinction many years since, and that, after expressing my gratitude, I humbly declined the honour, and which I again ask leave to do. At the same time I feel abundantly thankful for his Majesty's considerate remembrance of me, and remain yours faithfully, J. PASSMORE EDWARDS."

THE Ancient Lights Bill, the result of the labours of a joint committee of the Royal Institute of British Architects and the Surveyors' Institution, has been introduced by Mr. Fletcher Moulton, K.C., Mr. Robson, Mr. H. D. Greene, and Mr. Herbert Robertson, and was read a first time in the House of Commons on June 22; but, unfortunately, in the present congested state of business, so useful and practical a reform has no chance of becoming law. The measure has, as its full title, "An Act for Amending the Law Relating to Easements of Light," and it consists of eight parts and some twenty-seven clauses. Part I. provides that its operation is to be restricted to England and Wales, and Part II. consists of half a dozen definitions. Part III. deals with the limitations of the amount of light of a dominant owner, and Part IV. provides for the obstruction of an accruing light easement by notice in place of the existing clumsy mode of physical obstruction. Part V. provides that no title by presumption shall be acquired to light passing over a tenement on the opposite side of a street. Part VI. makes elaborate provisions for certificated plans of buildings about to be taken down, which will be of great interest to "official surveyors," by which term are described district surveyors in London, and county or borough surveyors elsewhere. Part VII. regulates the statement of claims arising out of rights to light, and is the most verbose of all, and Part IX. provides for the construction of a tribunal of appeal, consisting of nine members, to be appointed in equal proportions by a Secretary of State, the R.I.B.A. Council, and the Surveyors' Institution Council.

THE arrangements for the International Fire Prevention Congress, to be held next week at Westminster, convened by the British Fire Prevention Committee, have now been completed in detail. The congress membership will comprise over 800 professional men—mainly engineers, architects, and surveyors—together with a large number of fire brigade officers and municipal councillors and public officials, representing all parts of the United Kingdom, as also the colonies and the principal foreign countries. The congress will be conducted in general meeting and

in sectional gatherings, the whole of the technical arrangements being in the hands of Mr. Edwin O. Sachs as executive chairman, and there will be six sections, each of which will have its own colonial or foreign chairman and an English acting vice-chairman. The seat of the congress will be the Caxton Hall, Westminster, where all meetings, except the opening meeting, will be held, and the detailed arrangements there will be in the hands of Mr. Ellis Marsland, M.S.A., as hon. general secretary, and Mr. Sheppard, as hon. meeting secretary. The general opening meeting, timed for 11.45 a.m. Monday, July 6, will be at the Empress Theatre, Earl's Court, lent by the executive of the International Fire Exhibitor, and the Lord Mayor will open the congress. Four sections will meet simultaneously on Tuesday, Wednesday, and Thursday to read and discuss papers. The entertainments include a congress banquet to the colonial and foreign visitors on Wednesday, July 8, presided over by the Duke of Marlborough. There will be several evening entertainments, such as a *conversazione* and reception. The congress offices until the opening of the congress are at No. 1, Waterloo-place, S.W.

THE half-yearly return of the Works Committee of the London County Council covering the cost of works completed by the works department during the half-year ended March 31 last, has just been presented to the Council. It discloses some large and serious losses, mainly in connection with the erection of Horton Asylum, Epsom, and already fully discussed in the Council. The return deals with twenty estimated works, the final estimate for which was £591,790, while the actual cost has turned out to be £638,531, or a balance of cost above final estimate of £46,741. On only four of the works is any excess of cost over estimate shown, but in these cases the excess is £36,535. The cost of the building of the superstructure of the Horton Asylum has exceeded the estimate by £37,878, the final estimate being £291,165 and the actual cost £329,043. The erection of a central electric lighting station for the same asylum has resulted in an excess of cost over estimate of £1,977, on a job estimated to cost about £14,000. The provision of an "epileptic colony" on the Horton estate, as an adjunct to the asylum, has resulted in a balance of cost above estimate of £5,018. The other loss, which amounts to £11,617, is on the construction of the Hackney Wick relief sewer. This work was estimated at £125,329, and has actually cost £136,946. With regard to this work, the committee do not think that the ultimate cost is excessive, having regard to the difficulty of estimating accurately. A great deal of difficult work was encountered, and much pumping was necessary. The remaining sixteen works embraced in the return all show a balance of cost below estimate, the aggregate saving amounting to £9,791. The jobbing works executed by the committee during the half-year have resulted in a balance of cost below schedule value of £1,334. The committee state that the number of works referred to them for execution and not included in the present return was forty-one, representing an estimated expenditure of, approximately, £739,000; but they did not anticipate an excess of cost over accepted estimate in respect of any works where the accepted estimate was over £1,000.

AT a meeting of the London sub-committee of the Irish Landowners' Convention, held on Monday, Sir Thomas Butler presiding, it was unanimously resolved to recommend to the favourable consideration of the Government the position and claims of the Irish land agents on the ground that this class is a body of professional men of conspicuous ability, honourable antecedents, trustworthy characters, and possessing wide and varied experience in all practical business relating to the management of estates in Ireland. In forwarding this resolution to the Prime Minister and Mr. Wyndham, the meeting agreed to inclose a statement to the effect that the land agents of Ireland have rendered great services in the cause of law and order during troublous times and in trying circumstances; have always freely co-operated with the Executive Government to preserve peace in their respective districts; and have expended large sums of money in qualifying for their profession and in buying practices and partnerships. The statement suggests, moreover, that if for Government purposes it becomes necessary to legislate for these gentlemen, whose sole occupation, it is alleged, will be extinguished as a result of the

successful working of the law, "it would then appear as if the dictates, not only of justice, but of expedience, would point to compensation of some kind being provided by the State." A deputation from the Irish land agents were received on Tuesday in a committee room at the House of Commons by a number of members of Parliament representing all shades of political opinion. The deputation having expressed their views, a resolution was unanimously agreed to, expressing the opinion that the Irish land agents were entitled to compensation in the event of their being disemployed as a result of the Land Bill, and urging on the Government their claim to favourable consideration. Later in the evening Sir W. Hart Dyke communicated the resolution to Mr. Balfour and Mr. Wyndham.

THE Architectural Vigilance Society, of which Lord Windsor is the chairman, and of which Mr. Aston Webb, Professor Beresford Pite, Sir E. J. Poynter, and Sir W. B. Richmond are prominent members, have passed a resolution regretting that the competition of three years since for designs for the architectural treatment of the Strand-to-Holborn thoroughfare has been allowed to be without practical issue, and that, through the recent decision of the London County Council on the report of the Corporate Property Committee on the subject of the Holborn-to-Strand improvement scheme, there seems a prospect of the lessees being allowed to exercise their individual taste in building houses on this site. They suggest that, in view of the great importance of not letting slip so unique an opportunity for carrying out an architectural scheme of a dignified character (and failing the original proposition involving a uniform treatment of the whole site), the suggestion of the Corporate Property Committee that the work of designing the blocks (including the treatment of the crescent as a symmetrical whole) be intrusted to a selected number of architects should be reconsidered, with a view to its adoption by the Council.

AT a meeting of the general council for the Hampstead Heath extension scheme, held on Friday, under the presidency of Mr. G. J. Shaw Lefevre, a resolution was passed unanimously to the effect that steps should be taken to raise £48,000 for the purpose of acquiring 80 acres of land, offered by the Eton trustees at £600 an acre, lying on the north-west boundary of Hampstead Heath. Among the reasons urged for this were that the view from the Spaniards-road and the north-west heath would be retained; that if these fields could be kept as an open space, the thousands of people who will, it is hoped, be brought by the Tube would be landed at once in the midst of the country; that the development of the Tube and electric tramways will bring a large population to inhabit the neighbourhood of Finchley-road; and that there is a great and growing need for playing fields within a short journey of the Metropolis, and that parts of the proposed space might be made fit for games. Towards the required sum promises to the extent of £3,000 have already been received.

ON Saturday last Messrs. Eastwood and Co. invited the President, Council, and Members of the Incorporated Association of Municipal Engineers to their works at Conyer, to view the plant for making, drying, and burning stock bricks by Moller and Pfeifer's system, which we recently described (p. 648, Nov. 7, 1902) at some length. The guests, to the number of about two hundred, were conveyed by special train to Teynham, whence a pleasant drive brought them to Conyer, and, after a tour of inspection of the works, back to Sittingbourne, where they were entertained at lunch in the town-hall. The visitors, amongst whom were several practical brickmakers, were evidently greatly impressed with the new system, of which Messrs. Eastwood and Co. are the pioneers and agents in this country, and expressed themselves as highly pleased with their visit, whilst sympathising with Mr. Wragge and the members of the firm in the loss they had sustained by the death of Mr. Henry J. Byrne, Mr. Wragge's private secretary and head of the staff. We are asked to acknowledge the sum of two guineas collected during the return journey in aid of the Orphan Fund of the Municipal Engineers.

THE excavations being conducted for about ten days under the auspices of the Somersetshire Archaeological Society, at Castle Neroche, near Staple Fitzpaine, were commenced on Monday. The owner (the Viscount Portman) gave permission for the work, and, through the instru-

mentality of Mr. E. C. Treppin (his steward), he has given the society the services of four labourers. About six men are engaged on the work, which is carried out under the direction of Mr. H. St. George Gray, the society's curator. A section 10ft. wide is being dug through the ramparts and ditches on the south-west side of the great camp. Next week some excavations will take place on "the Beacon," towards the north. The distance to Neroche from Taunton is $7\frac{1}{2}$ miles by the Chard-road. It is the intention of the Archaeological Society to visit Castle Neroche on Wednesday, the 29th inst., during their annual meeting at Chard.

Mr. HENRY W. STOCK, F.R.I.B.A., writes pointing out that the increase of dwellings in the Lake District is adding seriously to the pollution of the waters, while steamboats cover the surface of Windermere for miles with ashes blown from their furnaces. A Local Government Board inspector is, he says, about to hold inquiries at Windermere into a sewage scheme, and, says Mr. Stock, "like his predecessor, will no doubt recommend the granting of the necessary loan to enable all the additional sewage of this fast-growing neighbourhood to be poured on to the saturated land by Parsonage Bay, Bowness-on-Windermere, where already the shore is fouled by black sewage ooze, and the reeds grow more rankly year by year in the shallows, and over all a fetid smell poisons the air along the pleasant walk to the Ferry. Half the charm of lake and river is derived from the purity of their waters, and Windermere and Bowness, with all their well-to-do residents, can well afford the extra cost of buying moorland away back from the lake, and pumping and treating the sewage there, as is done at other places where low rates are not allowed to be the paramount consideration."

At Friday's meeting of the Holywell Rural District Council a letter was read from a firm of solicitors, stating that they would be making application in the next Session of Parliament for power to construct and work a system of electric trams over a circular route, with headquarters at Connah's Quay. It was proposed that the tramways should be worked on the trolley or overhead system, power being drawn from the central power station, which will be erected by the North-Western Electricity and Power Gas Co. in the near future to afford a supply of electricity for that portion of their area of supply which comprises part of the county of Flint, the advantages to be derived from a cheap supply of power being thus obtained. The route selected passed from Sandcroft through Queen's Ferry, Connah's Quay, Flint, Bagillt, Holywell, Northop, Mold, Buckley, Hawarden, and back to Connah's Quay. A resolution was passed promising to support the scheme to the fullest extent.

The retirement of Professor William R. Ware, for twenty-two years the distinguished head of the Architectural Department of Columbia University, with which he is still to maintain a connection as Professor Emeritus, is announced by the *American Architect*, which adds: "Probably no architect in the United States is so well known to the community, as well as to his brother architects, as Professor Ware. Years ago, before there was any architectural school in this country, Mr. Ware, then in the active practice of his profession, admitted to his office in Boston a few pupils. On the establishment of the Architectural Department of the Massachusetts Institute of Technology, in 1867, he was immediately placed at its head. For sixteen years the Department prospered under his care, and on the formation of the Architectural Department of Columbia University, Professor Ware was immediately called to do for it what he had done for the Institute of Technology, but in a wider field, and with more ample resources; and the great School of Architecture of Columbia University is the result of his labours. For many years Mr. Ware has been called as assessor in nearly all important competitions, and the influence which he has steadily exerted in favour of fair dealing in such contests has been of incalculable value to the architects of the country."

A report has been published by the Russian Ministry of Agriculture and Domains on the working of the State forests during 1901. The gross revenue derived from this source is given as 57,486,900 roubles, or six millions sterling, of which 54,546,029 roubles resulted from the sale of forest products, an increase of 384,258 roubles compared with the previous year. The forest lands under the general forestry administration

on January 1, 1901, covered a total area of 642,403,400 English acres, consisting of 12,520 different forests, an area which was augmented during the year by 2,489,292 acres, principally in Asiatic Russia. On the other hand, forest under the desmesnial forestry administration showed a total diminution of 638,858 acres, the result of a revision of the forest boundaries.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—International Fire Prevention Congress. Opening Meeting at the Empress Theatre, Earl's Court. 11.45 a.m.

TUESDAY.—International Fire Prevention Congress at Caxton Hall, Westminster. General Meeting, 10.15 a.m. Sectional Meetings, 11.15 a.m. to 1.30 p.m.

Sanitary Congress Opens at Bradford.

WEDNESDAY.—International Fire Prevention Congress at Caxton Hall, Westminster. General Meeting, 10.15 a.m. Sectional Meetings, 11.15 a.m. to 1.30 p.m. Reception of Colonial and Foreign Delegates at B.F.P.C. Testing Station and Experiments, 3.30 to 6 p.m. Congress Banquet at Criterion, 7.30 p.m.

Sanitary Congress at Bradford. 9.30 a.m. to 2 p.m.

THURSDAY.—International Fire Prevention Congress at Caxton Hall, Westminster. Sectional Meetings, 10.15 a.m. to 12.30 p.m. General Meeting, 12.30 to 1.30 p.m. Demonstration of Experiments at B.F.P.C. Testing Station, 3.30 to 6 p.m.

Sanitary Congress at Bradford. 10 a.m. to 2 p.m. Lecture by John Slater, B.A., F.R.I.B.A., on "Architecture in its Relation to Hygiene." 8.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

JULY 10th: THIRD SUMMER VISIT—to Great Tangley Manor, Chisleworth, Franciscan Monastery, Church at Blackheath, Surrey, by Mr. C. HARRISON TOWNSEND and St. John's Seminary, Woking, by Mr. F. A. WALTERS. Train leaves Charing Cross at 2.6 p.m. and returns from Chisleworth at 7.56 p.m. P.O. for 4s. 6d. to be sent to the Secretary, 55, Great Marlborough-street, W., not later than THURSDAY, July 9th.

Members will oblige by forwarding changes of address to the Secretary for insertion in the new flower book.

H. P. G. MAULE } Hon. Secs.
H. TANNER, Jun. }

CHIPS.

On Monday the Bishop of Derby (Dr. Were) conducted the service at the opening and dedication of St. Alban's church, in Holly-road, South Retford. Mr. Hodgson Fowler was the architect, and Messrs. Bowman and Son, of Stamford, were the builders. £2,800 has been spent upon the fabric, which consists at present of chancel and choir and side aisles, whilst at the rear there is a large parish-room.

The south side of the parish church of Marton-in-Chirbury has just been beautified by two stained-glass windows. One represents the Light of the World, and the other depicts the mother of Timothy teaching him the Scriptures. The artist is Mr. John Davies, Wyle Cop, Shrewsbury. A short time ago a three-light window was placed in the chancel by Mr. Davies, representing the Baptism, Crucifixion, and the Ascension.

The Lieutenant-Governor has sanctioned the commencement of the new port works in Rangoon. A sum of Rs.5,16,724 is to be spent on reclaiming foreshore and providing pitched slope. Three new pontoon landing stages are estimated to cost Rs.5,11,296 and transit sheds, a trestle bridge, and tramway are estimated to cost a further sum of Rs.1,05,000.

A new refuse destructor was inaugurated at Heywood last week. It has cost £5,000.

Two days' celebrations were concluded at Overstone, Northamptonshire, on Wednesday, where the Bishop of Peterborough consecrated large additions to the parish church and Bishop Thicknesse a new organ. The church has been almost entirely rebuilt by Lady Wautage as a memorial to her husband, the late Lord Wautage, V.C., her father, the late Lord Overstone, and her grandfather, Mr. Lewis Loyd.

The London County Council, by a Bill which has passed through the House of Lords, are seeking power to provide, near the sites of the various street markets used by costermongers, a series of shelters in which the trades can be plied, leaving the thoroughfares free for traffic.

On Woolwich Common on Saturday a red polished granite obelisk, erected to the memory of the officers, non-commissioned officers, and men of the 61st Battery Royal Field Artillery who fell in the South African War, was unveiled.

The bridge at Hay Mills, Birmingham, is about to be reconstructed at the joint cost of the Birmingham Corporation, the tramway company, and the Warwickshire County Council.

Trade News.

WAGES MOVEMENTS.

EMIGRANTS' INFORMATION.—The July Circulars just issued by the Emigrants' Information Office state that in Canada nearly all trades, especially the building, metal and engineering, and wood-working and furnishing trades have been well employed, and in some parts there is a dearth of skilled labour, but not in British Columbia. In Victoria the effects of the drought continue, and there is no demand for labour. The furniture trade is in a very depressed condition; it is largely in the hands of Chinese, and the demand for European workers is very limited. In South Australia there is practically no demand for more mechanics in the towns; but a skilled hand, such as a mason, bricklayer, engine-fitter, blacksmith, joiner, or carpenter, can generally find employment after looking about for a little. Throughout Western Australia there is little demand for mechanics, but competent men in the building trades (except masons) can get work at Perth, Northam, and elsewhere. There is no demand for them at Fremantle, Coolgardie, or Albany. Men in the timber mills have been busy. In New Zealand the building and engineering trades have been busy in nearly all the principal places. In Cape Colony there is a demand for masons, bricklayers, carpenters, and others in the building trades, if they are skilled. The cost of living is high. Carpenters at Pretoria have struck for a minimum standard of £6 16s. a week. The building trades in the Transvaal continue brisk, and good carpenters and bricklayers can obtain work; but there is no opening for inferior or unskilled men. Plasterers and stone-cutters (free stone) are in demand. There is a fair demand for first-class painters, but none whatever for rough painters; they must be thoroughly good men, capable of mixing their own paints, &c. In the Orange River Colony there is a fluctuating demand for good carpenters, masons, fitters, and painters, and men's wages have been recently raised to 2s. 6d. an hour.

SUNDERLAND.—Of the 350 Sunderland house joiners who went on strike on the 1st inst., 150 of them have already found employment at 10d. per hour, the majority in the town, and the remainder in places at a distance. The representatives of the shipyard joiners, who are demanding an extra two shillings per week, will meet the employers during the next few days to arrange for arbitration so far as they are concerned. The Northern Counties' Federation of Building Trades Employers met at Sunderland, on Tuesday, and decided to lock-out their joiners over the whole district, in support of the Sunderland employers, who are resisting an application for an advance of $\frac{1}{4}$ d. per hour.

Mr. E. C. G. Malet, Local Government Board inspector, conducted an inquiry at Scarborough town-hall, on Saturday, into the application of the Scarborough Corporation for sanction to borrow £3,500 in respect of the repaving of Westborough and Newborough, leading from the railway station to the market-hall, and the aquarium top between the Valley Park and the South Foreshore. The borough engineer (Mr. H. W. Smith) stated that the work of laying the electric tramways would commence on October 1, and the present application was to borrow money for laying wood-paving blocks in the streets to be broken up.

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LIST OF COMPETITIONS OPEN.

Keighley—Board School, Moss Carr, Long Lee		H. Midgley, Clerk, School Board Offices, Keighley	July 4
Newark-on-Trent—Magnus Grammar School	£25 (merged), £15, £10	Goffrey Tallents, Clerk, Newark	15
Taunton—Carnegie Library (limit £5,000; Assessor)	£30 (merged), £20, £10	George H. Kite, Town Clerk, Municipal Buildings, Taunton	20
Stonehaven—Additions to Town Hall		George Murdoch, Burgh Surveyor, Stonehaven, N.B.	Sept. 12
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney lane, E.C.	(1904) Mar. 31
Swansea—Type of Terrace House for Working Classes	£10 10s.	The Borough Surveyor, Somerset-place, Swansea	

LIST OF TENDERS OPEN.

BUILDINGS.

Treforest—Houses (100) on Park Estate	Park Building Club	A. O. Evans, Architect, Pontypriid	July 4
Romsey—Cottage; and Additions to Police Station	Guardians	W. J. Taylor, County Surveyor, The Castle, Winchester	4
Helston—Additions to Workhouse	Burial Board	F. V. Hill, Clerk, Union Offices, Helston, Cornwall	4
Luddenden Foot—Additions to Longbottom Mills	Corporation	W. Clement Williams, Architect, 29, Southgate, Halifax	4
Tewkesbury—Repairs to Cemetery Chapels	Rural District Council	B. C. Gray, Superintendent, 181, Highgate, Tewkesbury	4
Glasgow—Maryhill Library	Admiralty	James R. Rhind, Architect, Inverness	4
Drung—School House	James Robertson and Sons	The Rev. J. O'Kane, P.P., Quigley's Point, Co. Donegal	4
Cork—Various Works	Guardians	John Cotter, Clerk, Board-room, Workhouse, Cork	4
West Bay, Bridport—Coastguard Buildings	Managing Committee	The Director of Works Dept., Northumberland-avenue, W.C.	4
Amberley—Detached Residence	Building Club	W. L. Barrett, Arcade Chambers, Bzornor	4
Catford, S.E.—Two-story Building	Quay Committee	Thos. George and Son, Architects, Old-square, Ashton-under-Lyme	4
Gilfach—Two Houses	Consett Iron Co., Ltd.	Wm. Harris, Architect, Gilfach, Pengam, Wales	4
Sligo—Auxiliary Dispensary Depot	Louth Grammar School Governors	J. Kilgallen, Architect, Abeyville, Sligo	4
London, N.W.—Orphanage	Guardians	Sidney G. Goss, 3, Broad-street Buildings, E.C.	4
Exley Head—Seven Houses, Wet Head-lane	Urban District Council	Barber Hopkinson and Co., Architects, North-street, Keighley	4
Cliffnydd—Ninety Houses	Collecidrim Colliery Co.	A. O. Evans, Architect, Pontypriid	4
Penzance—Store Addition at Albert Pier	Trevethin School Board	Frank Latham, M.I.C.E.I., Borough Engineer, Penzance	4
High Spenn—Workmen's Institute	Forehoe Union Guardians	Charles E. Oliver, Architect, Consett, Durham	4
York Town—Twelve Cottages, Alexandra-avenue	Industrial Co-operative Society	W. J. Hodgson, Vectis, Camberley	4
Louth—Science Buildings	Urban District Council	Ernest E. Bentley, Architect, 1, Pelham Chambers, Grimsby	4
Croydon—Alterations to Queen's-road Workhouse	Collecidrim Colliery Co.	F. West, Surveyor, 23, Coombe-road, Croydon	6
Lowick—House and Shop	Electric Light Committee	J. Lorimer Miller, Architect, 39, Hyde-hill, Berwick-on-Tweed	6
Glasgow—Physiology Buildings	County School Governors	James Miller, F.R.I.B.A., 15, Blythwood-square, Glasgow	6
Hornsey, N.—Additions to Highgate Depot	Guardians	E. J. Lovegrove, Engineer, 93, Southwood-lane, Highgate, N.	6
Glanamman—Workmen's Cottages (300)	University Court	David J. Michael, 97, Oxford-street, Swansea	6
Pontypool—Repairs to Schools	Arrol Griffin Building Club	Henry Bythway, Clerk, Pontypool	6
Dartmouth—Four Houses, Victoria-road	Markets Co.	E. H. Back, M.S.A., Dartmouth	6
Wicklow—Additions to Workhouse	Urban District Council	J. Owen Bond, Architect, 15, Upper King-street, Norwich	6
Nantymoel—Extension of Premises	Collecidrim Colliery Co.	The Secretary, Nantymoel, Ireland	6
Hornsey, N.—Additions to Sanitary Depot	Urban District Council	E. J. Lovegrove, Engineer, 93, Southwood-lane, Highgate, N.	6
Leith—Goods Stations on New Leith Lines	Collecidrim Colliery Co.	J. Blackburn, Secretary, 302, Buchanan-street, Glasgow	6
Derby—Battery-House	Electric Light Committee	Arthur Eaton, 6, St. James's-street, Derby	6
Caeaphilly—Congregational Church	County School Governors	W. Beddies Rees, Architect, 37, St. Mary-street, Cardiff	6
Abergele—School Enlargement	Guardians	Frank Ballis, Architect, 24, High-street, Bangor	6
Whitechapel, E.—Repairs, &c., Mile End-road	University Court	F. J. Toxtell, Clerk, 74, Vallance-road, Whitechapel, E.	6
Glasgow—Natural Philosophy Buildings	Arrol Griffin Building Club	Jas. Miller, F.R.I.B.A., 15, Blythwood-square, Glasgow	6
Aberthillery—Twenty Houses at Six Bells	Markets Co.	C. Telford Evans, Architect, 8, Queen-street, Cardiff	6
Wellington, Salop.—Town Hall	Urban District Council	C. R. Dalgleish, Architect, Central Chambers, Wellington, Salop.	6
Hornsey, N.—Additions to Muswell Hill Sub-Depot	School Board	E. J. Lovegrove, Engineer, 93, Southwood-lane, Highgate, N.	6
Belfast—Alterations to Castledawson Presbyterian Church	Collecidrim Colliery Co.	T. Houston, Architect, King's-court, Wellington-place, Belfast	6
Mansfield—Schools, Broomhall-lane	Rural District Council	Valance and Westwick, Architects, Mansfield	6
Glanamman—Three Hundred Workmen's Cottages	Urban District Council	David J. Michael, National Chambers, 97, Oxford-street, Swansea	6
Stranorlar—Three Labourers' Cottages	Collecidrim Colliery Co.	Geo. M'Laughlin, Clerk, Stranorlar	6
Hornsey, N.—Additions to Western Park Sub-Depot	Urban District Council	E. J. Lovegrove, Engineer, 93, Southwood-lane, Highgate, N.	6
Glasgow—Goods and Mineral Stations	Collecidrim Colliery Co.	The Divisional Engineer, Prince's-street Station, Edinburgh	6
Bradford—Shop Property, Manningham-lane	Gas Commissioners	Jas. Ledingham, F.R.I.B.A., District Bank Chambers, Bradford	6
Ringley, Lancs.—Seven Cottages	J. German	Grundy and Sons, 12, Brazenose-street, Manchester	7
Waltham Abbey—Foundations for Public Offices	County Hospital Committee	W. Turner-Streather, C.E., Highbridge-st., Waltham Abbey	7
Portsmouth—Enlargement of Post Office	St. Marylebone Borough Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	7
Kingswear—Cottage at Britannia Crossing	St. Marylebone Borough Council	G. K. Mills, Secretary, Paddington Station, W.	7
Bradford—Electricity Station, Sunbridge-road	St. Marylebone Borough Council	F. E. P. Edwards, A.R.I.B.A., Brewery-street, Bradford	7
Edinburgh—Entrance Lodge, Blackford Hill	St. Marylebone Borough Council	R. Morham, City Architect, City Chambers, Edinburgh	8
Dundee—Addition to Gasworks Office, East Dock-street	St. Marylebone Borough Council	Alex. Yuill, Engineer, Dundee	8
Leasgill—House	St. Marylebone Borough Council	John Banks, 14, Finkle-street, Kendal	8
King Cross, Halifax—House	St. Marylebone Borough Council	A. T. Whitely, Architect, 41, Stanley-road, King Cross, Halifax	8
Huntingdon—Verandah at Hospital	St. Marylebone Borough Council	S. Inskip Liddis, A.R.I.B.A., Market-place, Huntingdon	8
Edgware-road, W.—Tenement Dwellings, John-street	St. Marylebone Borough Council	Harry B. Measures, F.R.I.B.A., 16, Great George-street, S.W.	8
Ifton Heath—Four Cottages	St. Marylebone Borough Council	W. H. Spaul, F.R.I.B.A., The Gables, Oswestry	8
New Southgate—Cricket and Football Pavilion	St. Marylebone Borough Council	C. G. Lawson, Surveyor, Palmer's Green, N.	8
Darlington—Wing to Technical College	St. Marylebone Borough Council	G. Gordon Hoskins, F.R.I.B.A., Court Chambers, Darlington	8
Sproston—Alterations to Mixed School	St. Marylebone Borough Council	C. J. Brown, Architect, Cathedral Offices, Norwich	8
Allerwash, Fourstones—Pair of Cottages	St. Marylebone Borough Council	C. H. Sample, Land Agent, Matten, Corbridge-on-Tyne	8
Bradford—Mortar-Pan Shed and Engine-House	St. Marylebone Borough Council	F. E. P. Edwards, A.R.I.B.A., Brewery-street, Bradford	8
Ashton-under-Lyme—Fire-Escape Staircase	St. Marylebone Borough Council	Eston, Sons and Cottrell, Architects, Ashton-under-Lyme	8
Bermundsey, S.E.—Casing Steps of Town Hall with Marble	St. Marylebone Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Bermundsey	8
Halifax—Boiler-House, &c.	St. Marylebone Borough Council	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	9
Bristol—Re-fronting Premises, Marsh-street	St. Marylebone Borough Council	A. H. Yabbicom, M.I.C.E., City Eng., Queen-square, Bristol	9
Abercromby—Assembly Hall and Institute	St. Marylebone Borough Council	F. Gibson, Architect, Mountain Ash	9
Baldon—Residence	St. Marylebone Borough Council	Sam Bradley, Architect, Yorkshire Bank Chambers, Shipley	9
Londonderry—Main Entrance Gate to Victoria Market	St. Marylebone Borough Council	The City Surveyor's Office, Londonderry	9
Girlington—Six Houses, Woodlands-road	St. Marylebone Borough Council	Walker and Collinson, Architects, 227, Swan Arcade, Bradford	9
Stairfoot—Five Houses, Hunningley-lane	St. Marylebone Borough Council	E. W. Dyson, C.E., Architect, 14, Market-hill, Barnsley	10
Huddersfield—Twelve Cottages, Birch-road	St. Marylebone Borough Council	The Sec., Barry Brow Co-op. Society, Huddersfield	10
St. Austell—Wesleyan Schoolroom	St. Marylebone Borough Council	The Rev. W. L. Bennett, Wesleyan Minster, St. Austell, Cornwall	10
Leicester—Car Depot, &c.	St. Marylebone Borough Council	E. George Mawbey, M.I.C.E., Engineer, Town Hall, Leicester	10
Horden Colliery—Cottages (150)	St. Marylebone Borough Council	E. W. Lrall, 39, Northgate, Darlington	10
Stainland—Six Houses	St. Marylebone Borough Council	C. F. L. Horstall & Son, Architects, Lord-street Chambers, Halifax	10
Gardiffaith—Additions to Victoria Wesleyan Chapel	St. Marylebone Borough Council	Fisher and Sons, Architects, Club Chambers, Pontypool	11
Woolwich—Rebuilding Club, Beresford-street	St. Marylebone Borough Council	J. G. Cook, Architect, 15, Eleanor-road, Woolwich	11
Resolven—English Baptist Chapel (50 places)	St. Marylebone Borough Council	Chas. G. Baker, Architect, Town Hall Chambers, Great Yarmouth	11
Great Yarmouth—Five Cottages at Runham Vauxhall	St. Marylebone Borough Council	The Rev. David Baird, Carvaghy Minster, Banbridge	12
Garvaghy—Presbyterian Church	St. Marylebone Borough Council	J. Gibbons, Architect, 25, Cross-street, Manchester	12
Levenshulme—Cash Office	St. Marylebone Borough Council	Jacob Rees, Architect, Hill-side Cottage, Pentre	12
Cwmpark—Extending Infants' School	St. Marylebone Borough Council	W. Hartnett, Secretary, Chapel-street, Lismore, Ireland	12
Lismore—Cremerie	St. Marylebone Borough Council	R. A. Roberts, Architect, Abercromby, Mon.	12
Aberthillery—Three Classrooms (170 places)	St. Marylebone Borough Council	James Muscargh and Sons, Engineers, 5, Victoria-st., Westminster	12
Rhayader—House	St. Marylebone Borough Council	A. Saxon Snell, F.R.I.B.A., Southampton Blags., Chancery-l., W.C.	12
Lisson-grove, N.W.—Repairs, &c., at Dispensaries	St. Marylebone Borough Council	Geo. Dale Oliver, F.R.I.B.A., County Architect, Carlisle	12
Carlisle—Alterations to Crown Court	St. Marylebone Borough Council	D. Edward Thomas, Architect, Victoria-place, Haverfordwest	12
Pembroke Dock—Physical Laboratory, Bush-street East	St. Marylebone Borough Council	Jacob Rees, Architect, Hill-side Cottage, Pentre	12
Yoyhir—Converting Departments	St. Marylebone Borough Council	P. Vivian Jones, Architect, Hengoed	12
Bedding—Thirty-four Houses	St. Marylebone Borough Council	Henry Litter, Architect, County Offices, Preston	12
Urmston—Police Station	St. Marylebone Borough Council	H. Rose, A.R.I.B.A., 15, Cannon-street, Acrcington	12
Acrcington—Bank, Blackburn-road	St. Marylebone Borough Council	The Architect's Dept., 19, Charing Cross-road, W.C.	12
Deptford, S.E.—Four Blocks of Dwellings, Hughes Fields	St. Marylebone Borough Council	J. Owen-Jones, Shortmead-street, Biggleswade	12
Biggleswade—Vagrants' Ward	St. Marylebone Borough Council	A. Battery and S. B. Birds, Architects, Queen-street, Morley	12
Morley—Re-erecting Melbourne Mills	St. Marylebone Borough Council	Brocklesby, Marchmont, and East, Archts., 116, Jernyn-street, W.	12
Rotherhithe, S.E.—Four Blocks of Dwellings, Falford-street	St. Marylebone Borough Council	Jackson and Fox, Architects, 7, Rawson-street, Halifax	12
Sowerby Bridge—Additions to Calder Gilcloth Works	St. Marylebone Borough Council	Henry Litter, Architect, County Offices, Preston	12
Brierfield—Police Station	St. Marylebone Borough Council	W. W. Larmor, A.M.I.C.E., Banbridge, Ireland	12
Lurgan—Eight Labourers' Cottages	St. Marylebone Borough Council	Cook and Edwards, Architects, Masonic Buildings, Bridgeal	12
Portlough—Hotel	St. Marylebone Borough Council	J. Fletcher, County Surveyor, Wimbome	12
Sherborne—Repairing and Painting Fifteen Police Stations	St. Marylebone Borough Council	W. W. Larmor, A.M.I.C.E., Banbridge, Ireland	12
Lurgan—Ten Labourers' Cottages	St. Marylebone Borough Council	Sharp and Waller, Architects, 32, Bradford-road, Brighouse	12
Lightcliffe—Two Houses, Smith House-lane	St. Marylebone Borough Council		12

BUILDINGS—continued.

Seabrook—Police Station	Kent County Council	F. W. Ruck, County Surveyor, 96, Week-street, Maidstone	July 16
Cheadle—Isolation Hospital	Rural District Council	F. T. Inskip, Surveyor, Brookhouse, Cheadle	" 16
Walsall—New Buildings at Pleck-road Workhouse	Guardians	H. E. Lavender, Architect, Bridge-street, Walsall	" 16
Maidstone—Enlargement of Head Post Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 17
Preston—Abattoir	Corporation	The Borough Surveyor, Town Hall, Preston	" 17
Smallburgh—Additions to Workhouse	School Board	John T. Lee, Architect, 28, Great James-street, Bedford-row, W.C.	" 18
East Ham—School (1,592 places), Monega-road	Workmen's Institute Committee	R. L. Curtis, 120, London Wall, Moorgate-street, E.C.	" 20
Ton—Hall	H.M. Commissioners of Works	Jacob Rees, Architect, Pentre	" 21
Buckingham Palace—Coachhouse, &c., at Royal Mews	H.M. Commissioners of Works	J. B. Watcott, H.M. Office of Works, Storey's Gate, S.W.	" 21
Tooting, S.W.—Sorting Office	H.M. Commissioners of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 21
Buckfastleigh—Painting and Rough-casting Church Spire	Building Committee	Andrew Warren, Surveyor, Buckfastleigh	" 21
London, S.W.—Superstructure of New Admiralty Buildings	Hackney Union Guardians	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.	" 22
Walton-le-Dale—Church	L. & N.W. and G.W. Jt. Railways	John P. Seddon, Architect, The Vicarage, Walton-le-Dale, Preston ..	" 26
Chipping Ongar—Children's Homes	School Board	W. A. Finch, Architect, 78, Finsbury-pavement, E.C.	" 29
Shrewsbury—Railway Station	City of Watford Gas Co.	A. E. Bolter, Sec. to Joint Committee, Paddington Station, W.	Aug. 4
Watford—Household Management Centre	City of Watford Gas Co.	W. H. Syme, Architect, 4, High-street, Watford	"
Grays—Restoration of St. James' Church	City of Watford Gas Co.	Arnold, Baker, and Day, Solicitors, The Precincts, Rochester ..	"
Poyning and Hangleton—Additions to Parish Churches	City of Watford Gas Co.	E. H. Lingner Barker, Architect, 146, St. Owen's-street, Hereford ..	"
Llanelli—Villa, Victoria-road	City of Watford Gas Co.	Wm. Griffiths, F.S.I., Falcon Chambers, Llanelli	"
Creswell—Wesleyan Chapel	City of Watford Gas Co.	W. J. Morley and Son, Architects, 269, Swan-arcade, Bradford	"
Felixstowe—Gentleman's Cottage	City of Watford Gas Co.	George Wm. Leighton, Architect, Orwell-road, Felixstowe	"
Llanelli—House near Capel Iesa, Swansea-road	City of Watford Gas Co.	Wm. Griffiths, F.S.I., Falcon Chambers, Llanelli	"
Watford—Meter-House and Valve-Room	City of Watford Gas Co.	R. Bruce Anderson, A.M.I.C.E., 35a, Great George-st., Westminster ..	"
Sutton-in-Ashfield—Wesleyan Sunday Schools, Outram-street	City of Watford Gas Co.	Hy. Harper, Architect, 51, Long-row, Nottingham	"
Llanelli—Alterations and Additions to Carnawllon	City of Watford Gas Co.	Wm. Griffiths, F.S.I., Falcon Chambers, Llanelli	"
Barrow-in-Furness—Sunday Schools for St. Luke's	City of Watford Gas Co.	E. M. Young, Architect, 90, Duke-street, Barrow-in-Furness	"
Golecar—Reseating Gallery at St. John's Church	City of Watford Gas Co.	Arthur Shaw, Architect, Golecar	"
Cononley—Engine-House, &c., at Airedale Mills	City of Watford Gas Co.	J. Hagras and Sons, Architects, North-street, Keighley	"
Hkley—Semi-Detached Houses, Grove-road	City of Watford Gas Co.	Fredk. Musto, A.R.I.B.A., Greek-street Chambers, Leeds	"
Llanelli—Additions to Salem Chapel	City of Watford Gas Co.	Wm. Griffiths, P.S.I., Falcon Chambers, Llanelli	"
Bolton Percy—Wesleyan Chapel	City of Watford Gas Co.	Danby and Simpson, Architects, 10, Park-row, Leeds	"
Garlands—Medical Superintendent's House	City of Watford Gas Co.	Geo. Dale Oliver, F.R.I.B.A., County Architect, Carlisle	"
Kirkcaldy—Theatre, High-street	City of Watford Gas Co.	J. D. Swanston and W. Williamson, Architects, Kirkcaldy	"
Mexborough—Hotel, Doncaster-road	City of Watford Gas Co.	Geo. White, Architect, Market-street, Mexborough	"
Cockermouth—Repairs to All Saints' Church	City of Watford Gas Co.	John Fleming, Market-place, Cockermouth	"

ELECTRICAL PLANT.

St. Pancras, N.W.—Wiring and Fitting Goldington Buildings	Borough Council	C. H. F. Barrett, Town Clerk, Town Hall, Pancras-road, N.W.	July 8
Poplar, E.—Arc Lamp Carbons	Borough Council	The Borough Electrical Engineer, Glaucus-st., Bromley-by-Bow, E.	" 8
Leek—Electric Lighting Plant	Urban District Council	Bursall and Monkhouse, 14, Old Queen-street, Westminster, S.W.	" 9
Aberdare—Call Bells at Central Fire-Station	Urban District Council	Thos. Phillips, Clerk, Town Hall, Aberdare	" 11
St. Pancras, N.W.—Lead-Covered & Armoured Cable (31 mi.)	Borough Council	C. H. F. Barrett, Town Clerk, Town Hall, Pancras-road, N.W.	" 14
Ipswich—Electricity Meters	Corporation	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	" 14
Camden Town, N.W.—Electric Jenny, &c.	St. Pancras Borough Council	C. H. F. Barrett, Town Clerk, Town Hall, Pancras-road, N.W.	" 14
West Ham, E.—Tramway Cables	Town Council	J. K. Bock, Boro' Elect. Eng., Abbey Mills, West Ham, E.	" 14
St. Pancras, N.W.—Carbons (350,000)	Borough Council	C. H. F. Barrett, Town Clerk, Town Hall, Pancras-road, N.W.	" 14
Hammersmith, W.—Arc Lamps, &c.	Borough Council	G. G. Bell, Engineer, Electricity Works, 57, Fulham Palace-rd., W.	" 15
Weymouth—Electric Lighting Plant	Corporation	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	" 19
Sydney—Generating Set	N.S.W. Railway Commissioners	The Agent-General for New South Wales, 3, Victoria-street, S.W.	Sept. 12
Launceston, Tasmania—Electric Meters (500)	Corporation	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	" 25

ENGINEERING.

Flass Hall—Timber Footbridge	Brandon and Byshottles U.D.C.	J. McKenzie, Surveyor, Langley Moor	July 4
Paddington, W.—Boiler, &c.	Borough Council	E. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	" 6
Napsbury—Hot-Water Warming Apparatus at Asylum	Visiting Committee	Young and Brown, 104, High Holborn, W.C.	" 6
Bangor, Ireland—Station Meter	Urban District Council	The Gas Manager, Gasworks, Bangor, Co. Down, Ireland	" 6
Llimavady Junction—Repairing Sea Embankments	School Board	R. M. Feeter, Station Farm, Llimavady Junction, Ireland	" 6
Risca—Hot-Water Apparatus at Board Schools	Urban District Council	Ernest N. Johnson, Architect, Risca	" 6
Featherstone—Mainlaying, &c.	Guardians	Fredk. B. Rothera, Engineer, Council Offices, Featherstone	" 6
Preston—Boilers at Workhouse	Visiting Committee	James Clarke, Clerk, Union Offices, Preston	" 6
Napsbury—Steam Pipes, Radiators, &c., at Asylum	District Council	Young and Brown, 104, High Holborn, W.C.	" 6
Acton, W.—Steam Piping	Guardians	D. J. Ebbetts, Surveyor, 242, High-street, Acton	" 7
Windsor—Calorifier	Secretary of State for India	The Workhouse, Old Windsor	" 7
India Office, S.W.—Tank Locomotives	Urban District Council	The Director-General of Stores, India Office, Whitehall, S.W.	" 7
Huntly—Waterworks	Gas Commissioners	J. Barron, M.I.C.E., 216, Union-street, Aberdeen	" 7
Sedgely—Exhauster	Urban District Council	J. Brettell, Engineer, High Holborn, Sedgely	" 8
Dundee—Sulphate of Ammonia Saturator	Waterworks Commissioners	Alex. Yuill, Engineer, Dundee	" 8
Esher—Steel Footbridge	Gas Commissioners	A. J. Henderson, Engineer, Portsmouth-road, Thames Ditton	" 8
Hamilton—Waterworks	Harbour Trustees	W. R. Copeland, C.E., 146, West Regent-street, Glasgow	" 8
Dundee—Coal Conveyor, &c.	Waterworks Committee	Alex. Yuill, Engineer, Dundee	" 8
Swansea—Hydraulic Crane	East Sussex County Council	A. O. Schenk, M.I.C.E., Harbour Offices, Swansea	" 9
Bath—Waterworks	Guardians	Fox and Tatton, 5, Victoria-street, S.W.	" 10
Langley Bridge—Widening Bridge	Town Council	F. J. Wood, A.M.I.C.E., County Surveyor, County Hall, Lewes	" 11
Ballymena—Boiler	Metropolitan Asylums Board	Chas. Johnston, Clerk, Workhouse, Ballymena	" 11
Andover—Waterworks	Joint Hospital Board	T. E. Longman, Town Clerk, High-street, Andover	" 13
Caterham—Hot-Water Apparatus at Asylum	London County Council	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 14
Keighley—Weir, &c.	Metropolitan Asylums Board	H. M. Butterfield, Eng., 3, Laythorpe-ter., East Morton, nr. Bingley ..	" 14
Greenwich—Pier and River Wall	Borough Council	The Engineer's Department, County Hall, Spring-gardens, S.W.	" 14
Leavesden—Hot-Water Apparatus at Asylum	Borough Council	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 14
Penzance—Foreside Works	Baths Committee	Frank Latham, M.I.C.E.L., Borough Engineer, Penzance	" 15
London, E.C.—Pontoon Landing Stage	Tyne Improvement Commissioners	The Company's Office, 132, Oresham House, E.C.	" 17
Brigg—Cleansing a Portion of Ancholme Navigation	Corporation	Alfred Atkinson, Engineer, Brigg	" 18
Stepney, E.—Pipework, &c.	Corporation	Arthur Wright, Consulting Engineer, 27, Osborn-st., Whitechapel ..	" 21
Mountain Ash—Laying Gas-Mains	Corporation	John Williams, Town Hall, Mountain Ash	" 21
Manchester—Machinery, &c., for Victoria Baths	Corporation	The City Architect, Town Hall, Manchester	" 30
North and South Shields—Floating Landing Stages	Corporation	Robert Urwin, Secretary, Bewick-street, Newcastle-on-Tyne	Aug. 22
Valetta, Malta—Lift Construction	Corporation	The Receiver-General and Director of Contracts, Malta, Valetta	Oct. 30
Preston—Graving Dock	Corporation	James Barron, Engineer, Dock Offices, Preston	"

FURNITURE AND FITTINGS.

Workshop—Furnishing Kilton-hill Infirmary	James Snow Whall, Clerk, 44, Bridge-street, Workshop	"
Oldham—Fittings to Chemical Laboratory at School	C. T. Taylor, A.R.I.B.A., 10, Clegg-street, Oldham	"

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FENCING AND WALLS.

Paddington, W.—Retaining Wall.....	Borough Council	E. B. B. Newton, A.M.I.C.E., Boro' Sur., Town Hall, Paddington, W. July 6
Dartford—Boundary Wall at Infectious Hospital	Joint Hospitals Committee.....	Robert Marchant, A.R.I.B.A., 28, Theobald's-road, W.C. 7
Leeds—Unclimbable Fencing at Seacroft Hospital .....	.....	The City Engineer's Office, Municipal Buildings, Leeds
Vauxhall, S.W.—Boundary Wall, Tyers-street	Lambeth Guardians.....	W. Thurroall, Clerk, Brook-street, Kennington-road, S.E. 8
Lincoln—Wooden Fencing round Infectious Hospital	Sanitary Committee.....	R. A. Macbrair, City Surveyor, Corporation Offices, Lincoln
Merthyr—Boundary Walls for Extension of Pant Cemetery	Urban District Council	T. F. Harvey, Engineer, Town Hall, Merthyr Tydfil

PAINTING.

Glasgow—Maryhill Library.....	Corporation	James H. Rhind, Architect, Inverness
Bootle—Elementary Schools	Education Committee	J. H. Farmer, Town Clerk, Balliol-road, Bootle
Aberdeen—Waterside Bridge, Newburgh	Ellon District Committee	Forbes Philip, Road Surveyor, Ellon
Pontypool—Schools.....	Trevethin School Board	Henry Bythway, Clerk, Pontypool
Bradford—Technical College, Market, and Stables	Corporation	F. E. P. Edwards, A.R.I.B.A., Brewery-street, Bradford
Morley—Peel-street and Bridge-street Schools	School Board	Reuben Brown, Clerk, School Board Offices, Morley, Yorks. 6
Featherstone—Wrought-Iron Reservoir	Waterworks Committee	F. B. Rothera, C.E., Pontefract
Bradford—Shop Property, Manningham-lane .....	.....	Jas. Ledingham, F.R.I.B.A., District Bank Chambers, Bradford
Chester—Isolation Hospital	Corporation	The City Surveyor's Office, Town Hall, Chester
Norwich—Isolation Hospital, Bowthorpe-road	School Board	Arthur E. Collins, M.I.C.E., City Engineer, Guildhall, Norwich
Norwich—Schools	Guardians	C. J. Brown, Architect, Cathedral Offices, Norwich
King Cross, Halifax—House .....	.....	A. T. Whitely, Architect, 41, Stanley-road, King Cross, Halifax
Larne—Workhouse and Fever Hospitals	Corporation	S. M. Wallace, Clerk, Union Office, Larne, Ireland
Morley—Working-Men's Club and Institute	Guardians	John Asquith, Secretary, Morley, Yorks. 8
Darlington—Wing to Technical College .....	.....	G. Gordon Hoskins, F.R.I.B.A., Court Chambers, Darlington
Girlington—Six Houses, Woodlands-road	School Board	Walker and Collinson, Architects, 227, Swan-arcade, Bradford
Walsall—Workhouse	School Board	A. H. Lewis, Clerk, Union Offices, 29, Leicester-street, Walsall
Leeds—Wortley Library	School Board	The City Engineer's Office, Municipal Buildings, Leeds
Baildon—Residence.....	Urban District Council	S. Bradley, Architect, Yorkshire Bank Chambers, Shipley
Keighley—Schools	Urban District Council	H. Midgley, Clerk, School Board Offices, Keighley
Leeds—Schools	Standing Joint Committee	W. Packer, Clerk, School Board Offices, Leeds
Huddersfield—Various Schools	Corporation	Geo. Gaunt, Clerk, School Board Offices, Peel-street, Huddersfield
Merthyr Tydfil—Small-Pox Hospital at Twynrodyn	Sanitary Committee	The Surveyor's Office, Town Hall, Merthyr
Merthyr Tydfil—Chapels at Cefn Cemetery .....	.....	The Surveyor's Office, Town Hall, Merthyr
Sherborne—Fifteen Police Stations	Corporation	J. Fletcher, County Surveyor, Wimborne
Preston—Destructor and Pumping Station	Sanitary Committee	The Borough Surveyor, Town Hall, Preston
Manchester—Public Urinals and Lavatories .....	.....	The City Surveyor's Office, Town Hall, Manchester
Poole—Wesleyan Church, High-street.....	Corporation	John Elford, Seacombe, Wimborne-road, Poole
Loughborough, Leics.—Offices .....	.....	Edward Onions, Manager, Gas Offices, Loughborough, Leics.
Wibsey—Decorating Wesleyan Reform Chapel .....	.....	W. H. Sharp, Architect, 239, Rooley-lane, Bradford

ROADS AND STREETS.

Hooton—Making-up Oakfield-terrace-road	Wirral Rural District Council	Thomas Davies, 33, Kingsland-road, Birkenhead
Church Stretton—Road Improvements	Urban District Council	S. Giggell Jones, Surveyor, 26, Castle-street, Shrewsbury
Paddington, W.—Making-up Lauderdale-rd. and Biddulph-rd.	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W. 6
Dorking—Making-up Hart-road	Urban District Council	G. Somers Mathews, Town Surveyor, Dorking
Larne—Granolithic Footpath	Urban District Council	W. O. Young, Clerk, Town Hall, Larne
Chester—Making-up Broomfield-road	Urban District Council	The Surveyor's Office, Public Offices, Chester
Halifax—Private Street Works	Highways Committee	James Lord, C.E., Borough Engineer, Town Hall, Halifax
Paddington, W.—Asphalt Paving, Windsor-place	Guardians	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W. 6
Grimby—Street Works .....	.....	H. Gilbert Whyatt, Boro' Eng., Town Hall-square, Grimsby
Belfast—Street Works	Urban District Council	M'Crea and McFarland, 10, Donegall-street, Belfast
Leyton—Making-up Private Streets	Corporation	William Dawson, M.I.C.E., Surveyor, Town Hall, Leyton
Rochdale—Paving Bed of River Roch	Urban District Council	S. S. Platt, M.I.C.E., Borough Surveyor, Town Hall, Rochdale
Portslade-by-Sea—Street Works	Councillors	T. Austen, Clerk, Council Office, Portslade-by-Sea
Leith—Paving	Burial Board	T. B. Laing, Town Clerk, Leith
Bristol—Leveling Surface at Greenbank Cemetery	Town Council	T. H. Yabbicom, M.I.C.E., 63, Queen-square, Bristol
Poole—Making-up Mount-road	Urban District Council	John Elford, Borough Surveyor, Poole
Ryton-on-Tyne—Improvement, &c.	Corporation	J. P. Dalton, Engineer, Ryton
Southend-on-Sea—Making-up Genesta-road	Highways and Sewers Committee	E. J. Elford, M.I.M.E., Borough Surveyor, Southend-on-Sea
Cheltenham—Wood-Block Pavement .....	.....	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham
Stockport—Street Works .....	.....	John Atkinson, A.M.I.C.E., Boro' Sur., St. Petersgate, Stockport
Banchory—Macadamising Watson-street	John Ferries, Burgh Surveyor, Banchory, N.B. 10

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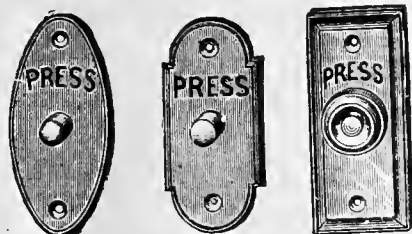
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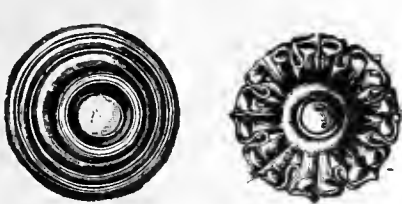
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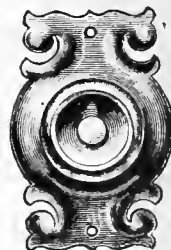


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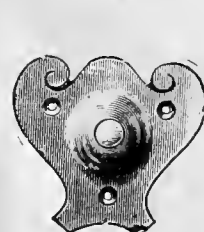


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T 1223. 2/3 ea. T 2671. 1/4 ea.

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in Brass, Copper,
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T 2777.
Brass 5/9, Copper 6/3



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Brass or Copper 21/- ea

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DEMONSTRATIONS AND PRICES ON APPLICATION.

Portsmouth—Asphalt Paving Works
Dewsbury—Paving Works	.....
Markyate—Kerbing Main Roads	.....
Ashton-on-Mersey—Making-up Private Street	.....
Hale—Making-up Beech-road	.....
Withington—Tar Macadam Repairs	.....
Islington, N. Tar Paving	.....
Barking—Making-up Victoria-road and Loxford-road	.....
Blackpool—Tar Asphalting Footways (One Year)	.....
Preston—Paving Works	.....
Wembley—Kerbing Footpaths	.....
High Barnet—Roads and Sewers, Barnet Common Estate	.....

Perth—Sewers	.....
Falmouth—Sanitary Conveniences	.....
Honcastle—Culvert	.....
Warrington—Culvert	.....
Ashton-in-Makerfield—Sewer, Old-road	.....
Swinton—Sewers	.....
Dringhouses—Sewers	.....
Hastings—Sewers	.....
West Brompton—Drainage Yards at Workhouse	.....
Trowbridge—Sewage Disposal Works	.....

Rotherham—Iron Staircase at Workhouse	.....
Featherstone—Special Pipes	.....
Hillsborough Station—Steel Girder Work (8½ tons)	.....
Featherstone—Cast-iron Pipes (206 tons)	.....
Fouthampton—Wrought-iron Pipes	.....
Whitehall, S.W.—Wrought-iron Gas-Piping (50,000ft.)	.....
Bath—Cast-iron Pipes (2,100 tons)	.....
Amsterdam—Steel Rails (7,280 tons)	.....
Dublin—Cast-iron Pipes	.....
Burnley—Cast-iron Flanged Pipes	.....

Badcliffe—Granite Setts	.....
Harrow-on-the-Hill—Broken Granite (2,000 tons of 1½in.)	.....
Bandon—Sewer Stench Traps	.....
Ealing, W.—Iron Castings, &c. (One Year)	.....
Goole—Retorts, &c.	.....
Ealing, W.—Paints, Gils, &c. (One Year)	.....
Featherstone, Yorks—Special Pipes	.....
Ealing, W.—Lime, Pipes, Cement, &c. (One Year)	.....
Ashford—Quernsey Granite (1,200 yards)	.....
Sheffield—Purifying Lime (5,000 tons)	.....
India Office, S.W.—Railway Stores	.....
Kingston-on-Thames—Granite (1,508 tons)	.....
Dewsbury—Various Stores (One Year)	.....
Salford—Lead Pipe, Iron Castings, &c.	.....
Cheltenham—Kerbing (10,000 lineal feet)	.....
Salford—Gasmeters, Cast-iron Pipes, Timber, &c.	.....
Salford—Paints, Read and White Lead, Oils, &c.	.....
Halesworth—Granite (250 tons)	.....
Leamington—Roadstone (4,500 tons)	.....
Hindley—Retort Settings, &c.	.....
Northfleet—Road Materials	.....
Rochester—Road Materials	.....
Ealing, W.—Stores (One Year) to Electricity Works	.....
Dewsbury—Granite Setts	.....

ROADS AND STREETS—continued.

Town Council	Alexander Hellard, Town Clerk, Town Hall, Portsmouth	July 10
Corporation	The Borough Surveyor's Office, Town Hall, Dewsbury	" 13
Hertfordshire County Council	Urban A. Smith, County Surveyor, 41, Parliament-street, S.W.	" 13
Urban District Council	F. Hutton, Surveyor, Public Hall, Ashton-on-Mersey	" 13
Urban District Council	J. G. Wyatt, Clerk, Ashley-road, Hale, Cheshire	" 13
Urban District Council	A. H. Mountain, A.M.I.C.E., Surveyor, Town Hall, West Didsbury	" 13
Borough Council	J. Patten Barber, Borough Engineer, Town Hall, Upper-street, N.	" 13
Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking	" 14
Highway Committee	P. S. Brodie, Borough Engineer, Town Hall, Blackpool	" 15
Corporation	The Borough Surveyor, Town Hall, Preston	" 17
Urban District Council	Wm. Bagshaw, Clerk, Public Offices, Wembley	" 21
	G. D. Byfield, 3, Stone Buildings, Lincoln's Inn, E.C.	—

SANITARY.

Town Council	R. McKillop, Burgh Surveyor, 12, Tay-street, Perth	July 6
Corporation	E. E. Armitage, Town Clerk, Municipal Offices, Falmouth	" 6
Rural District Council	Henry White, Surveyor, 4, Church-lane, Horncastle	" 6
Sanitary Works Committee	James Deas, A.M.I.C.E., Bank House, Warrington	" 7
Urban District Council	Thos. Burgess, Surveyor, Ashton-in-Makerfield	" 8
Swinton and Pendlebury U.D.C.	Henry Entwistle, Surveyor, Council Offices, Swinton	" 9
Bishopthorpe Rural District Council	Fairbank and Son, C.E., Lendal Chambers, Lendal, York	" 10
Corporation	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings	" 13
St. George's Union Guardians	Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.	" 13
Urban District Council	W. H. Stanley, A.M.I.C.E., Market House Chambers, Trowbridge	" 15

STEEL AND IRON.

Guardians	H. L. Tacon, Architect, 11, Westgate, Rotherham	July 4
Urban District Council	Fredk. B. Rothera, Engineer, Council Offices, Featherstone	" 6
Great Northern (Ireland, Ry. Co.)	The Company's Engineer-in-Chief, Dublin	" 6
Urban District Council	Fredk. B. Rothera, Eng., Council Offices, Featherstone, Yorkshire	" 6
Corporation	H. F. Street, Boro' Elec. Engineer, Municipal Offices, Southampton	" 8
Waterworks Committee	G. Miller, Director of Navy Contracts, Admiralty, Whitehall, S.W.	" 10
	Fox and Tatton, M.M.I.C.E., 5, Victoria-street, Westminster, S.W.	" 10
Corporation	Mart. Nijhoff, 18, Nobelstraat, The Hague	" 15
Rural District Council	Spencer Hart, City Engineer, City Hall, Dublin	" 15
	S. Edmondson, Engineer, 18, Nicholas-street, Burnley	" 18

STORES.

Urban District Council	W. L. Rothwell, Engineer, Council Offices, Radcliffe	July 4
Urban District Council	J. Percy Bennetts, Surveyor, Harrow	" 4
Rural District Council	A. Haynes, Clerk, Workhouse, Bandon	" 4
Town Council	C. Jones, M.I.C.E., Town Hall, Ealing, W.	" 6
Urban District Council	T. E. Franklin, Engineer, Gasworks, Goole	" 6
Town Council	C. Jones, M.I.C.E., Town Hall, Ealing, W.	" 6
Urban District Council	F. B. Rothera, Engineer, Council Offices, Featherstone, Yorkshire	" 6
Town Council	C. Jones, M.I.C.E., Town Hall, Ealing, W.	" 6
West Ashford R.D.C.	Alfred Sims, Surveyor, Charing	" 7
United Gaslight Co.	Hanbury Thomas, General Manager, Commercial-street, Sheffield	" 7
Secretary of State for India	The Director-General of Stores, India Office, Whitehall, S.W.	" 7
Corporation	Harold A. Winsor, Town Clerk, Kingston-on-Thames	" 8
Corporation	C. A. Craven, Gas Engineer, Gasworks, Savile Town, Dewsbury	" 8
Gas Committee	W. W. Woodward, Engineer, Bloom-street, Salford	" 9
Corporation	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham	" 9
Gas Committee	W. W. Woodward, Engineer, Bloom-street, Salford	" 9
Gas Committee	W. W. Woodward, Engineer, Bloom-street, Salford	" 9
Urban District Council	C. H. White, Clerk, Halesworth	" 10
Corporation	Leo Rawlinson, Town Clerk, Town Hall, Leamington	" 13
Urban District Council	H. O. Timmins, Manager, Gasworks, Hindley	" 13
Urban District Council	Chas. E. Hatten, District Clerk, Court House, Gravesend	" 15
Corporation	William Banks, A.M.I.C.E., City Surveyor, Rochester	" 15
Town Council	Albert E. Lewis, A.C.I.S., Electricity Dept., Town Hall, Ealing	" 16
Corporation	The Borough Surveyor, Town Hall, Dewsbury	" 20

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English	6 10 0 "	6 15 0
Wrought-Iron Girder Plates	7 0 0 "	7 5 0
Bar Iron, good Staffs	6 5 0 "	8 10 0
Do., Lowmoor, Flat, Round, or Square	20 0 0 "	20 0 0
Do., Welsh	5 15 0 "	5 17 6

Boiler Plates, Iron—

South Staffs	8 15 0 "	8 15 0
Best Smedshill	9 10 0 "	9 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.	
Builders' Hoop Iron, galvanised, £12 to £13 per ton.	

Galvanised Corrugated Sheet Iron—	
No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive	Per ton.
gauge	£11 15 0 .. £12 0 0
Best ditto	12 5 0 .. 12 12 6

	Per ton.	Per ton.
Cast-Iron Columns	£6 10 0 to	£8 10 0
Cast-Iron Stanchions	6 10 0 "	8 10 0
Rolled-Iron Fencing Wire	8 5 0 "	8 5 0
Rolled-Steel Fencing Wire	6 15 0 "	6 15 0
" Galvanised	8 5 0 "	8 5 0
Cast-Iron Sash Weights	4 12 6 "	4 12 6
Cut Clasp Nails, 3in. to 6in.	9 5 0 "	9 5 0
Cut Floor Brads	9 0 0 "	9 0 0

Wire Nails (Pointe de Paris)—											
to 7	8	9	10	11	12	13	14	15	B.W.G.		
8/8	9/0	9/3	9/9	10/3	11/0	11/9	12/6	13/6	per cwt.		

Cast-Iron Socket Pipes—		
3in. diameter	£5 15 0 to	£6 0 0
4in. to 6in.	5 12 6 "	5 17 6
7in. to 24in. (all sizes)	5 0 0 "	5 10 0

[Coated with composition, 3s. 0d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—	
	Per ton.
Cold Blast, Lilleshall	105s. 0d. to 112s. 6d.
Hot Blast, ditto	65s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

Gas-Tubes	67½ p. c.
Water-Tubes	62½ "
Steam-Tubes	57½ "
Galvanised Gas-Tubes	35 "
Galvanised Water-Tubes	59 "
Galvanised Steam-Tubes	45 "

	10cwt. caaks.	5cwt. caaks.
	Per ton.	Per ton.
Zinc, English (London mill)	£26 10 0 to	£27 0 0
Do., Vieille Montagne	27 5 0 "	27 15 0
Sheet Lead, 3lb. and upwards	14 7 6 "	14 7 6
Lead Water Pipe (F.O.R. Lead.)	14 17 6 "	14 17 6
Lead Barrel Pipe	15 2 6 "	15 2 6
Lead Pipe, Tinned inside	16 2 6 "	16 2 6
" and outside	17 12 6 "	17 12 6
Composition Gas-Pipe	16 2 6 "	16 2 6
Soil-Pipe (5in. and 6in. extra)	16 2 6 "	16 2 6
Fig Lead, in lwt. pigs	10 16 8 "	10 17 6
Lead Shot, in 28lb. bags	15 0 0 "	15 5 0
Copper Sheets, sheathing and rods	71 0 0 "	71 10 0
Copper, British Cake and Ingot	61 15 0 "	62 5 0
Tin, Straits	127 15 0 "	128 5 0
Do., English Ingots	127 0 0 "	127 10 0
Spelter, Silesian	21 0 0 "	21 7 6

TIMBER.

	per load	£10 5 0 to	£18 10 0
Teak, Burmah	10 0 0 "	16 10 0	
" Bangkok	10 0 0 "	16 10 0	
Quebec Pine, yellow	4 0 0 "	6 0 0	
" Oak	4 15 0 "	7 10 0	
" Birch	5 5 0 "	9 5 0	
" Elm	4 12 6 "	9 0 0	
" Ash	4 17 6 "	8 10 0	
Danitic and Memel Oak	2 15 0 "	5 5 0	
Fir	3 7 6 "	5 2 6	
Waincoat, Riga p. log	2 7 6 "	5 5 0	
Lath, Danitic, p.f.	4 0 0 "	6 0 0	
St. Petersburg	4 0 0 "	6 0 0	
Greenheart	7 15 0 "	8 0 0	
Box	7 0 0 "	15 0 0	
Sequoia, U.S.A.	0 3 6 "	0 3 9	
Mahogany, Cuba, per super foot	0 0 8 "	0 0 8	
1in. thick	0 0 8 "	0 0 8	
" Honduras	0 0 8 "	0 0 8	
" Mexican	0 0 4 "	0 0 5	
" African	0 0 3½ "	0 0 5½	
Cedar, Cuba	0 0 3 "	0 0 3½	
" Honduras	0 0 3½ "	0 0 3½	
Satinwood	0 0 10 "	0 1 9	
Walnut, Italian	0 0 3 "	0 0 7½	
" American (logs)	0 8 1 "	0 3 1	
Deals, per St. Petersburg Standard, 120-12ft. by 1½in.			
by 1½in. :—			
Quebec, Pine, 1st	£22 0 0 to	£29 0 0	
" 2nd	18 10 0 "	23 0 0	
" 3rd	11 10 0 "	14 0 0	
Canada Spruce, 1st	12 10 0 "	15 13 6	
" 2nd and 3rd	9 10 0 "	10 10 0	
New Brunswick	8 10 0 "	10 0 0	
Riga	7 10 0 "	8 5 0	
St. Petersburg	8 5 0 "	16 5 0	
Swedish	11 5 0 "	19 5 0	
Finland	8 15 0 "	10 0 0	
White Sea	11 15 0 "	19 0 0	
Battens, all sorts	6 5 0 "	13 5 0	
Flooring Boards, per square of lin. :—			
1st prepared	£0 13 0 "	£0 19 0	
2nd ditto	0 12 0 "	0 16 0	
Other qualities	0 6 0 "	0 13 6	

Staves, per standard M :—		
U.S. pipe	£37 10 0 "	£45 0 0
Memel, cr. pipe	220 0 0 "	230 0 0
Memel, brack	190 0 0 "	200 0 0

STONE.

Darley Dale, in blocks	per foot cube	£0 2 8
Red Mansfield ditto	" "	0 2 4½
Hard York ditto	" "	0 2 10
Ditto ditto 6in. sawn both sides, landings,	random sizes	per foot sup. 0 2 8
Ditto ditto 3in. slabs sawn two sides,	random sizes	" .. £0 1 3

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations	per foot cube	£0 1 0
Depot	" "	0 1 6½
Ditto ditto Nine Elms Depot	" "	0 1 8½

Portland Stone, in random blocks of 20ft. average :—

	Brown	White
Delivered to railway depot at the quarry	per foot cube	£0 1 5½ .. £0 1 7½
Delivered on road waggons	" "	" "
at Paddington Depot	" "	" "
Ditto Nine Elms Depot	" "	0 2 1 .. 0 2 2½
Ditto Pimlico Wharf	" "	" "

PETRE AND CO.

Blocks Palotte Banc Franc		
1	5	per o ft. ex. steamer London.
Ditto ditto Baac Royal	1 3	do. do.
Ditto Euville	1 9	do. do.
Ditto Comblanchieu	3 0	do. do.
Ditto Massangis (Roche)	2 6	do. do.

OILS.

Linseed	per tun	£22 0 0	to	£23 0 0
Rapeseed, English pale ...	" ..	24 5 0	"	24 15 0
Do., brown	" ..	22 10 0	"	23 0 0
Cottonseed, refined	" ..	23 5 0	"	23 10 0
Olive, Spanish	" ..	32 0 0	"	33 0 0
Seal, pale	" ..	26 0 0	"	28 0 0
Cocoonut, Cochin.....	" ..	33 0 0	"	33 10 0
Do., Ceylon	" ..	26 10 0	"	27 0 0
Palm, Lagos	" ..	26 15 0	"	27 5 0
Oleine	" ..	17 5 0	"	19 5 0
Lubricating U.S.	per gal.	0 7 0	"	0 8 0
Petroleum, refined	" ..	0 0 5½	"	0 0 5½
Tar, Stockholm	per barrel	1 6 0	"	1 6 0
Do., Archangel	" ..	8 19 6	"	1 0 0
Turpentine, American ..	per tun	37 0 0	"	37 5 0

Beeston Hill Baptist Church, Leeds, was opened last Wednesday. The new chapel has cost £1,500.

The Middlesex County Council have voted £1,375 towards the acquisition of a strip of land fronting Highgate Woods, which is to be acquired at a cost of £5,500, and added to the Woods.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXV.—No. 2531.

FRIDAY, JULY 10, 1903.

"SUPERPOSED" HOUSES.

A QUESTION of some significance to lessees and others came before Mr. Justice Swinfen Eady the other day as to whether under a covenant that "net more than one house shall be erected on any lot," a breach of the covenant had not been committed by a defendant in putting up on one lot two houses which were separated horizontally and not vertically. We have reported the main facts of the case in our last issue, in which it is stated a judgment had been given on a motion by the plaintiffs, "The Ilford Park Estates, Ltd.," for an injunction to restrain the defendant, her servant, agents, or workmen from erecting on certain lots in Brisbane-road, Ilford, more than one house within the meaning of a covenant in a conveyance dated November 14, 1898, and made between the parties, or any house of less value than £300, or any building whereof the elevation had not been approved in writing by the plaintiffs' surveyor upon any one of the lots. The plaintiffs conveyed to the defendant certain hereditaments forming part of the Ilford Park Estate, having a frontage of 54ft. towards Brisbane-road, and shown on the plan as three lots, and the covenant by the defendant was to observe, perform, and abide by all the stipulations contained in the schedule, which provided that no trade, business, or manufacture should be carried on upon any lot except lots fronting Ley-street. Clause 5 provided no house shall be erected fronting any road of less value than stated in the schedule, the value to be calculated at net prime cost, exclusive of the land. Not more than one house shall be erected on any lot. The minimum value per house in Brisbane-road was to be £300 each house. Another clause provided that no building was to be erected on any part of the land save when the elevations had been submitted to and approved in writing by the plaintiffs' surveyor, and a copy of the design deposited with the surveyor. The defendant intended to erect several buildings, and submitted first an elevation and then an amended elevation of the proposed buildings to the plaintiffs' surveyor, which the latter refused to approve. No elevation had therefore been approved. The buildings were to consist of two floors. On the ground floor was one complete tenement, with its own front door. On the upper floor was another complete tenement, with a separate front door opening on a staircase, which was divided by a brick wall from the ground-floor tenement. The two front doors were side by side, set back in an archway. It was alleged by the plaintiffs' surveyor that these buildings which were being erected were a breach of the stipulation in clause 5 quoted above. This was the question before the Court. Mr. Justice Swinfen Eady, in giving judgment, said: "The contention on behalf of the plaintiffs was that the defendant was putting up on one lot two houses which were separated horizontally and not vertically. It was not disputed that if the defendant was erecting two semidetached houses vertically separated they would constitute two separate houses; but it was contended that the building was, in reality, only one house. There was no internal communication between the ground and first floor; there was no common staircase, as the ground floor did not require a staircase, and there was no common front door, but separate front doors for each of the two tenements. In order to pass from one house to the other it was necessary

to pass out of the front door of one tenement to a space which opened upon the street, and to enter the front door of the other. The language in which Lord Brampton, in 'Grant v. Langston,' described the building then in question was exactly appropriate to describe the building in the present case. He said: 'One roof covers the whole building, but each story is so structurally composed and arranged for permanent occupation by a separate occupier that there is no internal communication of any kind between the two stories, nor any common staircase or access to or from the street or from any part of the outside of the premises, each having a separate entrance or entrances therefrom. In short, it would be impossible to erect two separate houses under one roof or to divide one building into two distinct and separate houses more completely than has been accomplished in the building under consideration.' Now the question was whether each of these buildings constituted one or two houses. On the one hand, reference was made to the cases of blocks of flats. The first case was that of 'Kimber v. Admans' (1900), before Mr. Justice Cozens-Hardy and the Court of Appeal, where the defendant had erected blocks of flats on the plots purchased by him subject to similar restrictions to those in the present case. There it was contended that each flat in a block was a separate dwelling-house; but the Judge held that each block of flats constituted only one house. He said: 'That which it is proposed to erect seems to me to be a house of the value of more than £500, and none the less a house of that value because it is proposed to be used as a series of flats.' On the other hand, in 'Rogers v. Hosegood' (1900), there was no question here of one house being built and being intended to be used as two. In substance there were here two houses structurally separated in every respect with separate doorways into the street, and with no internal communication. It was different from the case where a building was erected and intended to be used for flats. In that case there was internal communication. Here there was none. It appeared to his lordship that there was here merely one house superposed upon another house and divided horizontally. It was stated that with certain modifications of the plans the building could be converted into flats"; but his lordship did not discuss this. In his opinion, "each building constituted two separate houses, and was a direct breach of the covenant." An injunction was granted. We have given the judgment *in extenso*, because of the argument involved, which is important when so many dwelling-houses are built on the principle of superposition, or with separate entrances from the outside, to all intent separate and distinct dwellings, though divided horizontally by a floor, instead of vertically by a party-wall. It is a cheap mode of building, of placing two houses on one lot under the same roof. It was possible to expend the amount scheduled on each of the houses; but this was not the main point, which was that the defendant had erected two houses where there should only be one according to the terms of the agreement. If two semi-detached houses were vertically separated, no one could dispute the fact of two houses; but because of being horizontally separated by a floor, the defendant contended it was only one house, and this mode of building seems to have suggested itself for economy's sake, or so as to get more houses on the lots taken. Where a building was erected as a block of flats the matter was understood. Mr. Justice Cozens-Hardy's ruling appears to conflict with the decision just given; but a little consideration will show that it does not. Each block of flats was said to be one house, but here there was an internal staircase, and the block was built in flats; but in the Ilford Estate case there was no internal communication, and the

contention was that it was only one house—there was nothing said about flats. Yet the question is a confusing one, and is likely to be raised again. There should be a clear distinction drawn between a house in one occupation and a house in more than one occupation, which can be inserted in leases; there should be a structural distinction also between houses divided vertically by walls and those divided by floors into separate flats; and these differences should be defined in Building Acts and by-laws. A house and a block of flats are not the same according to the ordinary way people refer to these structures—a distinct meaning is attached to a house as a building in one occupation, or used by one family, in which the mode of separation between it and other houses is by walls; whereas a "block of flats" is understood to mean what it really is—a series of separate tenements one over the other divided by floors. A structural distinction between the two kinds of building is that in a house for one occupation there is internal communication by means of a staircase between the floors; in a block composed of two separate dwellings there is not. But in a block of flats there is internal communication from flat to flat by means of a staircase, so that this distinctive peculiarity does not invariably distinguish the private house from the block of flats. Therefore it appears that the most desirable distinction for a house is that it is in one occupation. The division horizontally by floors has its structural disadvantages: there is a greater risk of fire and infection, and is therefore not desirable on large building estates, while the division by party walls or outer walls limits the risk to each occupation. Then there is the question of elevation. In a block of two flats or more the architect is restricted to a repetition of feature on each floor, and variety of elevation is sacrificed to the exigencies of plan. In the Ilford Estate case the defendant submitted an amended elevation which the plaintiffs' surveyor refused to accept, although it was stipulated in the conveyance that no building should be erected on any part of the land save where the elevations had been submitted to and approved in writing by the plaintiffs' surveyor. The submission and approval of elevations is a safeguard to the kind and class of building intended to be erected. In this particular instance an elevation would at once have disclosed the purpose of the building, and its being intended for two families instead of one; but, according to the report of the proceedings, no elevation had been approved. The decision will be useful if it prevents the erection of double or "superposed" houses on estates where private dwellings are intended, and it will strengthen the hands of surveyors and authorities in the exercise of their duties. We refer the reader to the full report given in our last issue.

THE LAW OF ANCIENT LIGHTS.

WE have at length a promise of amendment of the law relating to easements of light in the Ancient Lights Bill brought in and read a first time in the House of Commons on the 22nd ult. As our readers are aware, the Bill is the outcome of the labours of a joint committee of the Institute and the Surveyors' Institution. That committee was formed after the useful papers read before the Institute by Mr. Fletcher Moulton, K.C., M.P., Professor Beresford Pite, and Mr. Douglass Mathews, which we reported at the time. The members of the joint committee included Messrs. Edward A. Gruning, J. Douglass Mathews, J. Fletcher Moulton, K.C., the late Professor Roger Smith, appointed by the Institute, and Messrs. A. Rose Stanning, A. T. Steward, H. Chatfield Clarke, and G. Mallows Freeman, K.C., appointed by the Surveyors' Institution. The Bill, which comes with the joint approval of both

professional bodies, is divided into eight parts. We gave last week a brief notice of the provisions, and we may now more carefully examine the chief sections. In Part II, two definitions are worth notice. The definition of "tenement" is important, and is as follows:—"Tenement includes land, also any dwelling-house, workshop, or other building." "Street means and includes any highway, road, bridge, lane, mews, footway, square, court, alley, passage, whether a thoroughfare or not, and a part of any such highway, road, bridge, &c." "Occupier does not include a lodger." The most important section of the new Bill is the third, which deals with the "Limitation of the Amount of Light of a Dominant Owner," and runs as follows:—"From and after the commencement of this Act an owner of a dominant tenement shall, subject as herein provided, be entitled to such amount of light passing over the servient tenement as is reasonably necessary for the comfortable use and enjoyment of the dominant tenement of a dwelling-house, or for its beneficial use and occupation if used as a place of business or for any other purpose than a dwelling-house, and he shall not be entitled to any extraordinary amount of light necessary for any particular purpose, trade, or occupation." The object of this section is to prevent a dominant tenement owner setting up a claim for an extraordinary amount of light that may be necessary for any trade that requires minute, intricate handling, or the selection or comparing of colours, &c.—a very just and desirable provision that will put a stop to those unreasonable demands for light which check building progress in London and other large towns. Sub-section (2) clearly states that "nothing in this section shall confer on the owner of any dominant tenement any right to a greater amount of light than he would have possessed if this Act had not passed." But the next sub-clause (3) makes the exception in certain special cases; the section is not to "apply to a tenement in which a trade or occupation requiring an extraordinary amount of light has been continuously carried on for 10 years during the continuance of such trade or occupation." Two main classes of building or tenements are thus distinguished—one the ordinary dwelling-house or business premises in which no trade or occupation is carried on requiring any large amount of light, and the other tenements or workshops which have enjoyed for ten years an extraordinary amount of light for particular trades or professions. It will be, perhaps, not so easy in practice to draw the distinction; dominant owners who have enjoyed the light for the time named in ordinary tenements may contend that their rooms, or some of them, are occupied by trades which require ample light. They will, in fact, put themselves in the position of those who claim an extraordinary amount of light under sub-section (3). The next sub-section (4) states that this section only applies when the right of the dominant owner becomes absolute and indefeasible after the commencement of this Act. When, for instance, a dominant owner has not attained this absolute right, the section will not apply.

Part IV. deals with the important question of putting the law in operation. Section 4, in brief, provides that an owner of a tenement which is not servient to another till a certain time has elapsed may serve upon the occupier of the latter, and upon other interested persons, a notice, called an "Obstruction to Light Notice," which is to be in writing according to a given form contained in the first schedule of this Act, and accompanied by a plan and section or elevation, showing the windows the access of light to which is obstructed. This section will much simplify procedure, by preventing an owner of a tenement that may become dominant from making preparations to build. Sub-

section (3) states that on and after the day of service of this notice the access of light mentioned in the notice "shall be deemed to be obstructed as if the same were actually and physically obstructed,"—a provision which will supersede the need for unsightly boardings and obstructions before windows. Sub-section (4) says that any person aggrieved by such notice shall be entitled to the like relief so far as may be as he would have been entitled to if the access of light to the windows mentioned in the notice had been actually and physically obstructed by the person serving the notice; and an obstruction to light notice (5) shall, subject to any relief which may be granted before the expiration of one year from the day of service thereof by a Court of Jurisdiction, be deemed to be and shall have the like effect as an interruption within the meaning of section (3) of the Prescription Act, 1832, which has been acquiesced in for a year. It is also provided (6) that it shall be the duty of the vendor, on the sale of a tenement, to disclose any obstruction to light notice which might have been issued, and it shall be the duty of any person who receives any such notice in respect of a tenement he holds as lessee or occupier for a term of years to forward such notice to his next superior landlord.

These provisions, it will be seen, are intended mainly to supersede the present light conditions, by preventing the accruing of right of light by lapse of time. The obstruction to light notice will be in effect the same as an interruption under the Prescription Act. According to the present law the accruing of the right to light can be prevented by the owner of the servient tenement obstructing the dominant tenement owner's windows before the light has been enjoyed by him for twenty years; but by the proposed Act, the owner of the tenement not yet servient will be able to accomplish the same end by less objectionable and easier means.

By Part V. section 5, no title shall be acquired by prescription under the Prescription Act 1832, or at Common Law, by the owner of any building which shall have been erected after 31st of December, 1890, and which abuts on any street, to a right to light passing over a tenement on the opposite side of the street. This is a reasonable section, and provides that all buildings erected after that date are not in a position to acquire a right to light over opposite buildings, and therefore the owner of any opposite building will be free to raise his premises to any convenient height he pleases. The effect of this law will be to encourage a development of building in streets, and to reduce the number of servient tenements.

Part VI. deals with the provisions for certificated plans of buildings about to be taken down. The clauses are important to the profession. Section 6 (1) enacts that the owner of a building about to be taken down and rebuilt may cause plans, sections, and elevations to be prepared, and may apply to the official surveyor to survey the building and certify the correctness of such plans, &c. Every application to the said surveyor is to be accompanied by a fee according to a table given on the schedule for such inspection and certificate. The official surveyor (3) shall either grant a certificate that in his opinion the plans, section, and elevation are correct, or may refuse to do so, in which case he is to state the grounds of refusal; if the surveyor refuses to grant a certificate (4), the applicant may cause fresh drawings to be prepared, and may make a further application to inspect and survey the building; if the surveyor still refuses, the applicant may at any time within fourteen days make application to the tribunal of appeal, by way of appeal against such refusal, accompanied by a copy of the surveyor's refusal (6). A certificate (7) granted under this Act will be conclusive evidence

of the correctness of such plans, &c., in any actions relating to the right of the owner of such building to light. The official surveyor means, in the case of a building in the County of London, the district surveyor, and if in any other county, not within a borough, the county surveyor, and if in a borough the borough surveyor. A register of such drawings is to be kept by the official surveyor, and the drawings are to be deposited at the county hall, and be open to public inspection, on payment of a fee (subsections 8 and 9). One of the advantages to be derived from these provisions is that all disagreement about the building to be taken down and rebuilt, as to the positions and sizes of the windows, will be avoided, and the certified drawings will be open to the inspection of all parties interested in the right of light. No less important is the power given to the official surveyor, whoever he is, to investigate and examine the premises to be rebuilt, and to certify, or refuse to certify, the correctness or otherwise of the drawings prepared—a provision which will put a stop to all precipitate building disputes and unnecessary legal proceedings, which are now so often costly, and are begun for the purposes of "blackmail." By the next section, 7: (1) a servient owner who intends to erect a new building, or alter an existing one, can be required by the dominant owner to give him, or any person appointed on his behalf, facilities to inspect the plans, sections, and elevations of the intended new building or alteration; or if there be no such plans, &c., give such information relating to the intended building as the dominant owner may require. A great "bone" of contention will by this clause be removed. At the present time servient tenement owners who propose building or altering their premises proceed without giving their neighbours any information until they are taken to book. They often do not give them any opportunity of seeing the plans and of making any objection. By this section the dominant owner will be entitled to see the drawings, and, if possible, to come to conciliatory terms with the building owner before the latter begins to build; and in this manner friction and lawyers or surveyors' fees will be saved. Sub-section (2) states that the dominant owner may within seven days after inspecting the plans or receiving information, serve upon the servient owner notice in writing of his objections or the terms on which he is willing to permit the servient owner to erect his building. The notice is to be in writing, and sent by registered post, or served personally. The notice (3) may also contain name and address of surveyor, who will act on dominant owner's part in case of any difference arising. The servient owner within seven days may, after service of notice, serve the dominant owner with notice in writing that he accepts the terms, and an agreement be come to; if, on the contrary, the servient owner is not willing to accept terms, he shall within seven days of the notice serve notice in writing that he refuses the terms, and shall state the name of surveyor who will act on his behalf (4 and 5). Section 8 (a) provides that if the servient owner does not accept terms, the two surveyors appointed within ten days of the appointment of the last of them, meet and try to determine the question in dispute, and shall (b) appoint an umpire, a member of the R.I.B.A. or of the Surveyors' Institution, and (c) the umpire is to view the site and the dominant and servient tenements, and make his award within 21 days after the original time appointed by the Act. Section 9 details the matters the arbitrators or their umpire may decide: these include the right of building owner to build; the alteration, if any, necessary to be made in the building, so as to prevent or lessen obstruction to light of the tenements as set out in notice of objection; the amount of compensation, if any, to be

made to the owner or occupier; alterations, if any, to the adjoining premises by light-reflecting surfaces, enlargement of lights, heightening of premises, &c., amount of costs. Sections 10, 11, and 12 relate to neglect of appointment of surveyor within the prescribed time or the unwillingness of the umpire to act; in such case either party may apply to the President of the R.I.B.A. or the President of the Surveyors' Institution, who will appoint an umpire; the appeal that may be made from surveyors by either party to the tribunal of appeal; reference of dispute to High Court, and other formalities of such action. These sections will greatly facilitate the settlement between the parties. The appellant to the tribunal, if he refuses to accept the decision, can bring an action in the High Court; but the Act enables both parties to come to amicable terms by arbitration before resorting to law. Part VIII., section 15, deals with the constitution of the tribunal of appeal. It is to consist of three barristers-at-law appointed by the Secretary of State, three members appointed by the council of the R.I.B.A., and three members by the council of the Surveyors' Institution. A member to be appointed for a term of one year, and at the expiration of his term of office shall be eligible for reappointment. The other sections relate to removal of members, remuneration, jurisdiction, and regulations as to procedure. The tribunal have power to hear the parties either in person or by counsel; also to determine to what extent proposed new buildings may be amended or the dominant premises altered. Section 27 provides that in any action by a dominant owner against a servient owner in which an injunction is claimed, notwithstanding that an injunction by an interlocutory order have been already granted upon the application of the servient owner, either party may apply to a judge of the High Court, either to hear such action with assessors, or to refer the matter to arbitration according to the provisions. The judge, on hearing the application, may consider the claim may be satisfied by damages, and on his own motion refer the case to arbitration, and if on such hearing he shall be of opinion that the action for an injunction has been unreasonably commenced, he may order the party bringing the action to pay the costs of the defendant on such scale as he may think fit. This useful clause is intended to prevent any dominant owner from bringing any unnecessary action for an injunction against the servient owner, and to enable either party to obtain redress. The vindication of the right, according to the present law, is often troublesome in the extreme where a right is in danger of being infringed. A person may obtain redress by means of an injunction. Often the slowness of the cause is apparent, and the Court may give only nominal damages and refuse an injunction. The damage often sustained by a dominant tenement owner may be small, and compensated by a small money payment. Then a mandatory injunction is a more vindictive means resorted to—an order to compel the defendant or building owner to pull down and restore the building which obstructs the light to its previous condition. This kind of injunction is reluctantly granted by the Court. Then an interlocutory injunction has been granted both in Common Law and the Chancery Divisions pending the decision of an action, the object of which is to prevent the erection or enlargement of a building, or the pulling down of a building. The legal remedies for redress where rights of light infringed or threatened by an action for damages or by an injunction to restrain, in practice are involved and difficult. The new Bill will take into account threatened injuries which are now not dealt with: a money payment will be substituted for any injunction to restrain, so that develop-

ment of building in our towns will not be wholly stopped, and equitable terms of settlement arranged. The law as amended will help much to simplify legal procedure. The tabulation or registration of buildings which are about to be rebuilt or altered will simplify matters. Correctly measured and certified plans and elevations will be made and inspection rendered easy by all parties interested on payment of a small fee. The building owner, above all, will have to make his intention known before he begins building, or even preparing plans, and thus a great loss of time which now takes place will be saved, besides costly alterations to plans and buildings. By the employment of an architect and surveyor by the dominant and servient owner, the question of infringement will be dispassionately discussed, and many disagreements arising chiefly from misunderstandings or feeling in the matter will be avoided. There may be a few alterations and amendments necessary in the Bill, but as it stands it embodies in principle the resolutions formulated many years ago, chiefly based on proposals which the late Professor Roger Smith, the late Mr. Arthur Cates, and Mr. Douglass Mathews had laid before the Science Committee as long ago as 1881. It is singular indeed to find many of the advantages and points which the Bill embodies were foreshadowed during the earlier discussions of the question, and are the results of the practical experience of professional men. The hard-and-fast dicta of the Law Courts have been taken, instead of a reasonable treatment in which an equivalent value or damages is given to the party aggrieved. A practical rule of estimating damage is necessary if we are to have any real improvement, by which every obstruction may be estimated at its true value. Decisions have been exceedingly obscure and difficult of comprehension; the judge sometimes has refused to give damages, but restrained the building owner by granting an injunction. By awarding damages in all cases of infringement, a reasonable course would be followed. In the case of buildings advanced, damages estimated in view of actual interference of the light is a fair mode of dealing with the offending party, but even such damages will be small if the law as amended becomes operative.

INTERNATIONAL FIRE PREVENTION CONGRESS.

DURING the present week an International Congress on Fire Prevention has been held in connection with the Fire Exhibition at Earl's Court. Some eight hundred members, English and foreign, have been accredited to the congress, including official delegates from fifteen Governments, and representatives of various British Governmental departments, local authorities, public institutions and societies, and the meetings, which, with the exception of the opening one, have held at the Caxton Hall, Westminster, have been well attended and characterised by much interest.

The inauguration of the Congress was performed by the Lord Mayor and Sheriffs at the Empress Theatre, Earl's Court. The delegates were welcomed by the Lord Mayor and Lord Windsor, First Commissioner of Works. Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, delivered an opening address, in which he foreshadowed various reforms needed in the near future. In connection with the question of standardising tests would come the banishment of those fraudulent traders who, under the title of "fireproof," tried to palm off on unwary architects, builders, and landlords spurious materials and unsafe systems of construction. The conference ought to take the first steps towards making it illegal to sell unsafe materials under the name of "fireproof." The word, which was a misnomer, ought to be excluded from the vocabulary of the English and American nations; it was the committee's intention always to substitute the word "fire-resisting." Municipal authorities should be made to recognise that building regulations must be supplemented by

regular fire surveys or fire patrols, with the view of obtaining preventive measures in the equipment and use of buildings. The conference might do well to draw the attention of those concerned to the necessity of extending the existing forms of special regulations for theatres or factories to other classes of buildings, especially to boarding schools. The great insurance companies were to be congratulated on having at length published their requirements as to specific classes of risks in buildings; but these needed to be extended and classified for the guidance of intending building owners and their advisers.

Sir Louis Lépine, Prefect of Police, Paris, formally presented four medals from the President of the French Republic to Mr. Sachs, Lieutenant-Colonel Fox, Mr. H. S. Folkes (secretary of the National Fire Brigades Union), and Mr. Brasier (chairman of the London Private Fire Brigades Association) for their services in connection with fire brigade work.

The various sections—six in all—met at the Caxton Hall, Westminster, on Tuesday, Wednesday, and yesterday (Thursday), for the reading and discussion of papers. Section I., over which Mr. A. Darbyshire, F.S.A., V.P.R.I.B.A., presided, was devoted to "Building Construction and Equipment"; Section II., Sir W. M. Preece, K.C.B., F.R.S., chairman, dealt with "Electrical Safeguards and Fire Alarms"; and Section III., with Captain Thomson in the chair, had as its subjects "Storage of Oils and Spontaneous Combustion"; and the others were Section IV., "Fire Survey and Patrols," Prince Alexander L'voff, chairman, and Mr. Guy Pym, M.P., as acting vice-chairman; Section V., "Fire Losses and Insurance," Sir J. J. Runtz presiding; and Section VI., "Fire Tests and Standardisation," with Mr. E. O. Sachs in the chair.

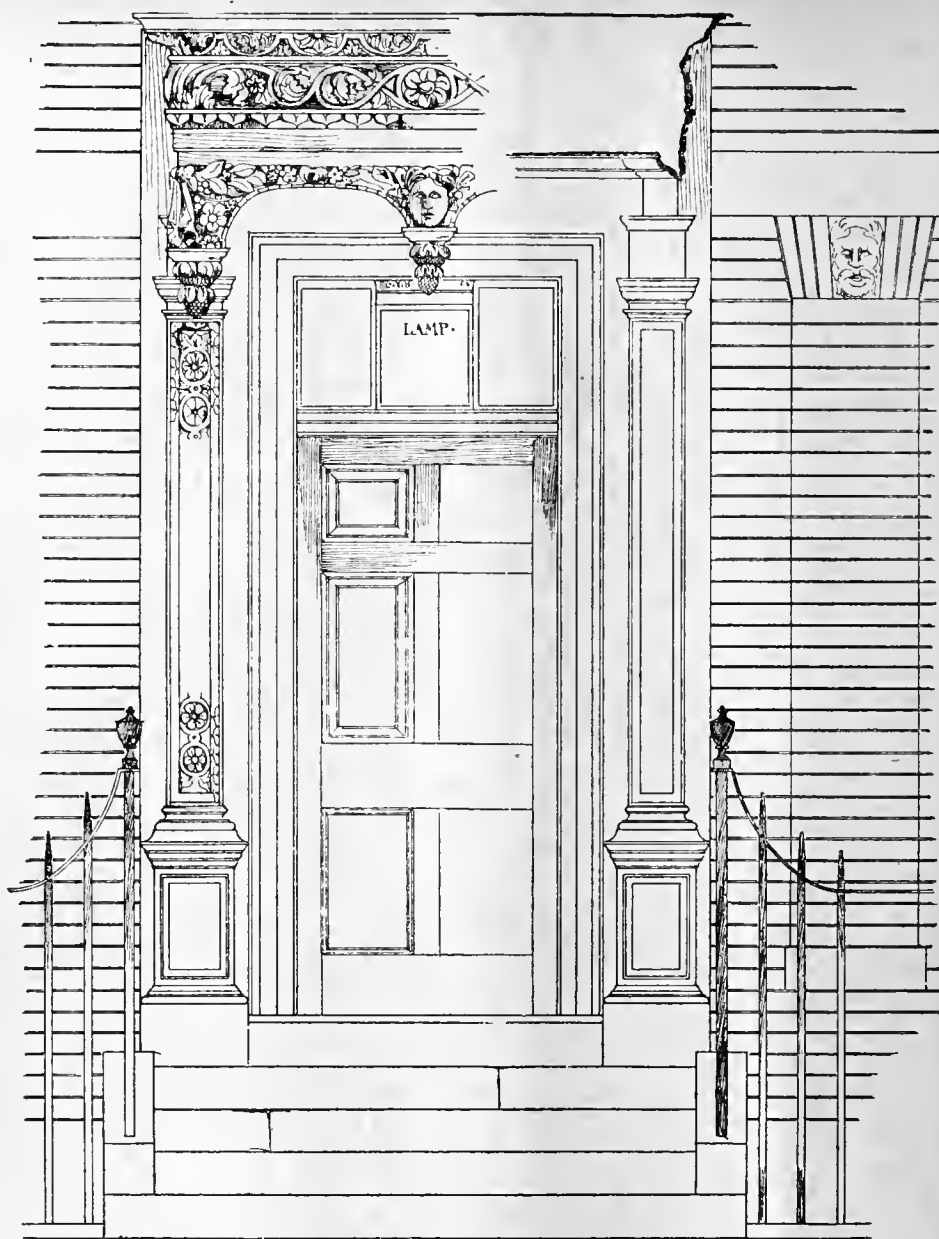
Amongst the papers read in Section I. on Tuesday was one by Mr. Max Clarke, A.R.I.B.A., on "How to make Existing London Buildings More Fire-Resisting." The author referred to the importance of careful selection of constructional details and materials in view of the inherent danger there always was in large cities in the proximity of one building to another. Matchboarding was used in places where it could very well be done without as regards the construction, and it was a material the use of which on walls and ceilings, so far as safety in case of fire went, was much to be deprecated, as the fire passing along it at a high speed often rendered escape from a building impossible. He urged that matchboarding should not be permitted to be used in new buildings, and that after a certain date it should be removed from all old buildings. The naked joists in ceilings could easily be protected and ceilings made fire-resisting by covering them with wire netting or some form of expanded metal and plaster. The most important point in buildings of the warehouse class was the means adopted at present for the prevention of the spread of fire in lift wells. Great improvements could be made in this matter if all lift shafts were properly inclosed in some form of non-combustible material. There were also defects in fireplaces and flues which could be remedied.

Mr. Ellis Marsland, M.S.A., district surveyor for Cumberwell and hon. secretary of the Congress, read on Wednesday a short paper on "The Planning and Arrangement of Large Retail Commercial Establishments." He pointed out that in dealing with this question there are at least four points to be taken into consideration: Firstly, the interests of the proprietor; secondly, the safety and convenience of the customer; thirdly, the local building regulations; and fourthly, the claims of the fire department. The proprietor's demands are plenty of window space, plenty of floor and wall space upon which he may erect his counters and fittings, and plenty of light, preferably from the north. The customer requires ample staircase and elevator accommodation, plenty of gangway space, and easy exit and egress. The building regulations may require a limited amount of cubical space; therefore the building, if a large one, will have to be divided into compartments, and these shut off from one another by fire-resisting doors. The fire department claims that any outbreak of fire may be quickly localised, the occupants passed to a place of safety, and that short work be made of any outbreak by reason of its being attacked from more than one point. Also that adjoining premises be not unduly endangered. This is the problem set the architect in planning and designing a building of

this character. In order to give practical value to his observations, the lecturer dealt with a typical case on a site of 70ft. by 200ft., fronting to two streets, the cubic capacity being restricted to 250,000c.ft., as in the London regulations. On such a given site he would place a building four stories in height, which would mean some 55ft. from the ground floor to the level of the top of the topmost story. The cubical contents of such a building would require that it be divided up into three compartments. In solving the problem he adopted what may be termed the well-and-compartment system. The proprietor had ample floor and wall space, and the light is provided by means of large glazed lanterns from the roof, throwing a flood of light down the well on the several floors, in addition to any side lighting that might be available. The customers have six staircases running from ground floor to roof, with an elevator provided to each. The door openings in the compartment walls are opposite one another and in direct line with the exits into either street. It is necessary that all the floors and supports be of fire-resisting construction, and all iron and steel work protected by concrete or hollow tile casing. There being nothing but the contents to burn, the task of the fire department would be a simple one. A fire on any floor could be attacked from above and below. The openings in the party walls would be a means of getting readily at the seat of the fire, and at the same time affording a chance of escape in an emergency. The well and lantern would form a shaft for the escape of smoke, and the flat roof would afford access to this from the several staircases. The fire-resisting doors in the openings could with facility be closed, and the fire confined to one compartment. The unpacking, packing, or store department, if situated in the basement, should not communicate with the upper part, except by lift, placed outside the building, inclosed with walls carried up through the roof and covered with a light roof of iron and glass, and the openings on each floor protected with fire-resisting doors. The offices and counting-houses should be in an adjoining annexe, and the dining and sleeping accommodation for the staff placed over and in this annexe, with separate exit and staircase and fire-resisting floors.

Mr. Bernard Dicksee, A.R.I.B.A., district surveyor for Newington and Southwark, followed with a paper on the "Fire-Preventive Sections of the London Building Act," in which he dealt in detail with the provisions of the five measures under which the construction of buildings in the Metropolis is controlled, and epitomised the leading decisions in regard to fire-prevention governing their interpretation in actual practice. The lecturer then proceeded to deal with some very important omissions from the London Building Act, which urgently demanded further legislation. The chief of these was the question of the proper protection of iron and steel from the action of fire. The London County Council have the power, hitherto not exercised, to make by-laws on this subject; but it should be dealt with not by by-law, but by a section in an Act requiring the protection of all columns, stanchions, brusses, and joists. Another neglected subject was the internal construction of warehouse buildings, in which at present inflammable materials could be used. Matchboard lining, especially in warehouses, should be severely regulated, and so should also lath-and-plaster partitions, the use of which, indeed, should be discouraged as far as possible. Other omissions from the present Act were lift shafts and steel-framed buildings. He regretted that the licensing of wooden structures had been transferred by the London Government Act of 1899 from the County Council to the borough councils. The question of exit in case of fire was almost ignored until the passing of the Building Act of 1891, and was therein very imperfectly dealt with. The proviso in section 68 of that Act, that buildings exceeding 60ft. in height should be provided with such means of escape "as can reasonably be required," was most unsatisfactory, as it gave arbitrary power to an official or a committee. The exemption sections of the Building Act needed careful revision, and such exemptions should be reduced to a minimum. Mr. Dicksee argued that the scope of the Act should be extended, so as to make its provisions applicable to existing buildings, but that the power of interference by authorities with such structures should be exercised only once, and the controlling body should, he held, be the London County Council.

Among the papers read in Section III. was one

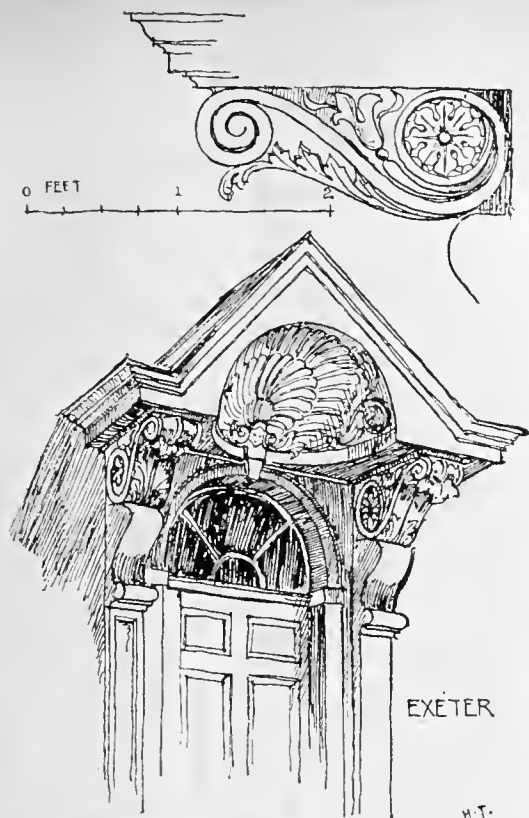


DOORWAY TO 19, QUEEN ANNE'S GATE, S.W., THE OFFICE OF MR. ASTON WEBB, R.A., P.R.I.B.A.

by Professor Ira Woolson, of Columbia University, New York, on "Fireproofed Wood as a Building Material." The author urged that all permanent construction should be strictly incombustible, and no system of building should be recognised as fire-resisting unless proved to be such by practical test, such as those carried out by the British Fire Prevention Committee in London and in the United States by the New York City authorities, also by the National Board of Underwriters at their testing laboratory in Chicago, and by the Insurance Engineering Experiment Station in Boston, Mass. The term "fireproof wood" is a misnomer for all such woods that burn if exposed for a sufficient time to a high degree of heat. Strictly speaking, the processes of treatment did not make the woods fireproof, but simply rendered them fire-retardants. Fire-resistant wood was a much more logical term. The author had, under the direction of the Bureau of Buildings, to test most of the wood which has been used in lofty buildings in New York. For the year ending the first of this month he had tested and reported upon upwards of 3,500,000ft. The greatest part of this material was for floors, which were laid on the top of strictly fireproof floor construction of the concrete or hollow tile. The balance of the material was used for trim. Most of the tests employed were more or less unsatisfactory, the one which he favoured being a method designed by himself and known as the "timber" test. The specimens for this test were accurately cut to a size of 1½in. by ½in. by 12in. These "timbers"

were tested in pairs by being laid across the top of a gas crucible furnace, in which a constant temperature of 926° Cent. = 1,700° Fahr. was maintained. This particular temperature had been chosen because it was given by the New York Building Code as approximately the heat of a burning building. At the end of two minutes the specimens were removed, and duration (1) flame and (2) glow noted for each. The temperature was under constant control by means of a Le Chatelier pyrometer. The proportions of gas and air were regulated to furnish a vigorous flame 8in. to 10in. above the furnace, so imitating an ordinary fire. After test the specimens were sawn in two at the middle and tracings made of the unburned wood. These tracings were then measured by planimeter, and the percentage ratios to the original cross-section calculated. The percentage of unburned wood was printed upon the tracing of each specimen, and then blue-prints were made which became a part of the permanent record. These tests showed that the tendency of untreated woods to burn was from ten to twenty times that of treated woods, the two chief defects of treatment being that it weakened the wood, and rendered it more brittle, and that it tended to make the wood absorbent of moisture.

A series of tests were carried out at the British Fire Prevention Committee's station in Porchester-terrace on Wednesday and Thursday afternoons. Those on the former day dealt with doors and partitions, while yesterday floors of Karri and other hardwoods were experimented upon.



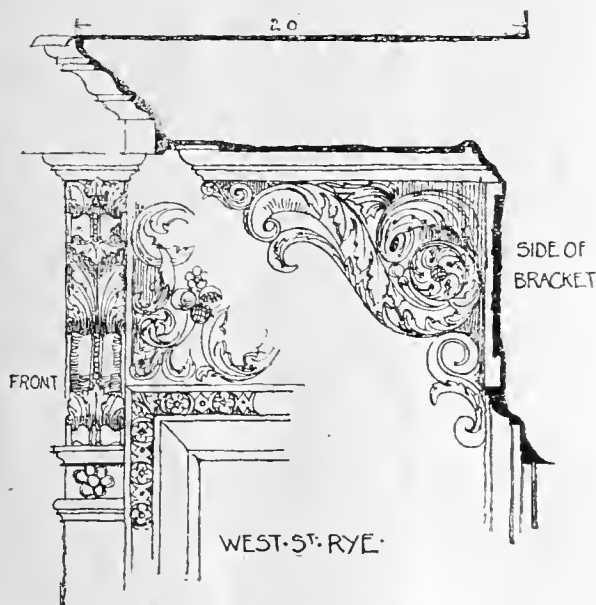
HOOD TO DOORWAY AT EXETER.

Mr. F. R. Farrow, F.R.I.B.A., asks us to announce that he has resigned the chairmanship of the Commercial Section and membership of the Executive of the British Fire Prevention Committee, and also the title of Hon. Publications Secretary of the International Fire Prevention Congress.

OLD ENGLISH DOORWAYS.*

MR. W. GALSWORTHY DAVIE has photographed a capital series of porches and entrances from historical English buildings, and

in book form by Mr. B. T. Batsford, giving seventy full-page photographic plates, besides the sketches and marginal notes with which the introductory essay is enhanced, making a most admirable addition to any library of architectural and artistic books. The subjects thus brought together comprise many of the best types of doorways to be seen in England. Among these we note some by no means well known, such as the early example of a shaped, headed, framed opening from Looe-street, Plymouth, with moulded jambs and stopped ends, a highly suggestive and pretty piece of simple design, having



DOORWAY HOOD AND BRACKETS AT RYE, SUSSEX.

Mr. Henry Tanner, jun., has compiled some useful and suggestive descriptive notes of the examples chosen, which range from the days of the Tudors to the end of the 18th century. The result of this combined undertaking is produced

mouldings dividing the face of the door into compartments rather than framed panels, essentially Gothic in idea. The projecting porches of the Middlehouse, Mayfield, and the Butchers' Guildhall, Hereford, are more familiar and interesting, though the ornamental parts of the latter on the posts and brackets should not be imitated. The garden-wall doorway from Payne's

Alms-house, Oundle, like the central porch of the Weekly Hospital, Northamptonshire, has a shaped gable as its surmounting feature, said by Mr. Tanner to show foreign influence, which, however, remains a matter of opinion. They both appear to us to indicate rather the spirit of Sir Thomas Fresham's design. Great Wigsell, Sussex, has a good sample of the style, of which the Sackville College at East Grinstead is a model in the same county, while the Gate House, Kenilworth, has a more monumental entrance flanked by niches in the same type of Renaissance earlier in date than the last named, having detail very like some at Knoke, which was erected in 1605. Anyway, these early specimens, as at Cobham and Hatfield, form contrasts by their richness to the plainer work in which they are so happily set, giving a practical suggestion of more value to the architect than an exact knowledge of their chronological order of building. The Manorhouse at Upper Ewell, Gloucester, with a largely treated arched pediment inclosing a cartouche, strikes us as an unusual and handsome piece of work, though the impostes are coarse and plain. From "Bateman's," Burwash, Sussex, a small door reminds the reader of Mr. Ernest George's Jacobean freedom of design, with an association, perhaps, of Belgian or Dutch fancy. The Deanery, Battle, Sussex, the churchyard gate at Ross, Herefordshire (leading from "The Prospect," and dated 1700), and the doorway of the Vicarage, Hailsham, Sussex, commence a series of Classic portico designs chiefly from Kent and the home counties. Of shell-canopied doorways there are several good instances illustrated—some in stone and plaster and some in wood—from Burford, Oxon, Ledbury, Herefordshire, Bristol, High Wycombe, and including the famous one originally at Fairfax House, Putney, but now at Hampstead. The two canopied hoods from Grosvenor-road, Piccadilly, and the Manor House, Bermondsey, are particularly rich and interesting; while that from "Brickwall," Northam, Sussex, has been imitated in modern houses several times already with more or less success. The remaining plates are devoted to later types of work. We need hardly point out how very important a feature the doorway of every building necessarily is—how it makes or mars a façade—while no feature repays the designer more fully for study and refinement of detail. Everyone must see the entrance to all buildings visited, and it furnishes the keynote of the whole composition, no matter how plain the rest of the work may be. A collection like this, though it is by no means, of course, exhaustive, or even complete, cannot fail to be useful. It makes a nice volume for a present, and, without being overweighted with descriptive matter, is more than a mere collection of photographs casually got together. The red linen cover appropriately completes the book, which does the publisher every credit.

CHIPS.

The Queen Victoria Memorial Almshouses have been opened at Newport, Mon., by the mayor. Accommodation is provided for nine inmates, and in addition a slender income of £24 per annum for each of these is supplied by an endowment. The houses, which are situated on Stow-hill, stand on three sides of a square, inclosing a grass lawn; they are one-story buildings, floored throughout with wooden blocks, and lighted by electricity.

The Borough Council of Hampstead have agreed to the erection of a block of workmen's dwellings in Upper Park-road. The new dwellings are estimated to cost £13,004, and will contain 123 rooms, divided into twelve tenements of two rooms each, twenty-four of three rooms, and eight of four rooms.

The Cornwall Laundry Co.'s undertaking at Pengegon, near Camborne, was formally opened last week. The builder was Mr. John Barbary, of Dolcouth-road, Camborne.

At the last sitting of Glasgow Dean of Guild Court linings to the total value of £87,588 were granted. The University Court received authority to erect workshops, stores, offices, and inclosure walls in Erdington-street, Oran-street, and Sawmillfield-street; and Sir Wm. Arrol and Co., Ltd., to erect a pattern-shop and drawing office in Preston-street.

The Treasury have agreed to make a further free grant of £5,000 in aid of the Pwllheli Harbour scheme, in addition to the £17,500 which has already been secured. The harbour works will now be proceeded with without delay, and the inauguration of a scheme costing, roughly, £60,000 cannot fail to materially advance the prospects of the town.

* Old English Doorways. By W. GALSWORTHY DAVIE and H. TANNER, Jun. London: B. T. Batsford. 15s. net. Cloth, gilt top.

OBITUARY.

ALDERMAN THOMAS BARNABAS LOWE, of Burton-on-Trent, the head of the well-known firm of Messrs. Lowe and Sons, builders and contractors, died on Tuesday. He was in the sixty-third year of his age. Mr. Lowe's public work began with the incorporation of the town in 1878, when he was elected a member of the first town council. At the inaugural meeting he was chosen one of the aldermen, and in 1884, and again in 1885, was elected mayor. He was placed on the commission of the peace for the borough, and also for Staffordshire and Derbyshire. By his connection with the corporation he was closely associated with the principal works of public improvement in the borough, and he served with distinction on the gas and the highways committees. He sat for twelve years on the school board, and during a portion of the time was the vice-chairman. He was deeply interested in the Burton infirmary, of whose committee he was for many years chairman, and he afterwards accepted the honorary secretaryship. Although he was president of the Burton Master Builders' Association, he was in full sympathy with labour, and in bringing employers and employed together he averted many a strike and removed much bitterness. His firm have carried out most important works in various parts of the kingdom, and notably in Birmingham.

ON BUILDING TIMBERS.—XXX.

YELLOW PINE (*PINUS STROBUS*), WHITE SPRUCE (*PICEA ALBA*).

THE price of yellow pine varies more, for the same size and branded quality, than any other wood commonly used in building, first quality "bright," 3in. by 11in., bringing from £17 10s. up to £32 10s. per Petersburg standard, or from 2s. 1½d. to nearly 4s. per cube foot. It need scarcely be said that at the latter price this wood seldom or never finds its way into builders' joinery, or even into furniture, judging by specimens of the latter so frequently seen outside "easy instalment" shops where mahogany is fourth quality stained yellow pine, and solid walnut spruce of the vilest kind smeared over with a wash of dirty brown ochre. Handsome suites of "solid" American ash or walnut are built up with three or four different kinds of wood, which may be described as the offal of the market, and this showy rubbish, pitched together without a decent joint in it, or in many cases the saw kerfs being taken out of the wood, finds a ready sale amongst City clerks and others, who fail to see that the stuff is not good enough for a decent piggyery, much less a human dwelling. Some few years ago the writer superintended the cutting of a quantity of timber in a mill at the East-end of London, in a locality celebrated for its shoddy furniture "industry." From time to time one of the smaller saws was requisitioned for the use of regular customers, who came with short pieces of tree trunks and branches which they selected from a quantity thrown together in an adjoining yard. The sawdust from these pieces appeared to be very damp. On squeezing it between both hands water ran out as if from a sponge, yet within three days this wood was converted into the centre pillar of a solid walnut table which cost the shopkeeper 15s., polished complete. To make the wood at all workable, the outside was rapidly dried before a fire which the operative kept up in his bedroom all night, and every scrap of waste wood, even to that knocked out of packing-cases, was used up in the manufacture of drawing-room and bedroom suites! The panels of doors, window-backs, soffits, linings, and all framed work where painted should be of yellow pine, for they can be obtained in one width, and glued joints, so common in Swedish doors, are completely avoided; but care should be taken that in nailing mouldings round panels none of the nails enter the panels, or the latter will be certain to split in shrinking if the wood is not kiln-dry. Nothing is more common in old work than split panels, and this failure invariably occurs from nailing the moulding through the panel whilst the moulding itself is also nailed to the stiles and rails of the door; in fact, all panels should be free to move in the grooves which hold them in their places, and in good work it is just as important that they be selected absolutely free from knots. Where wide panels of yellow pine are necessary, it is advisable to cut them on the

quarter, or radially, for they have a tendency to buckle slightly in the centre where not stayed by the framing. Work would, no doubt, stand better with narrow panels than with wide ones: that is, the faces would remain more nearly plane surfaces as they leave the bench. When a panel exceeds 7in. in width, and it is cut tangentially, the centre will be found after 10 or 15 years to be more or less a winding. If there are knots they will be split, and their surfaces will be out of line with the panel faces. It has always been a recognised custom in the trade to cut oak for joinery with its greatest dimension (width or thickness) in line from the centre of the tree to its circumference; it is of importance that the same method of conversion be adopted in dealing with yellow and other pines if it is necessary to produce work which will stand well. Ordinary qualities of yellow pine from Montreal, Port Leamington, Gander Bay, Lewisport, Botwoodville, Ottawa, and Quebec sell for the following prices:—First, 3in. by 11in., £21 15s.; 3in. by 10in., £17 10s. to £19 5s.; 3in. by 9in., £19 5s.; 3in. by 8in., £18 5s.; 3in. by 7in., £10 5s.; 3in. by 4in. to 6in., £12 5s.; 3in. by 4in. and 5in., £10. Second, 3in. by 12in. to 15in., £14 10s.; dry, "bright," 3in. by 11in., £15 10s. to £19 5s.; ordinary, 3in. by 12in. to 15in., £14 10s.; 3in. by 11in., £14 5s.; 3in. by 10in., £11 5s.; 3in. by 9in., £11 15s.; 3in. by 8in., £10 5s.; 3in. by 7in., £10; 3in. by 6in., £10 15s.; 3in. by 4in. and 5in., £10. Third, dry, bright, 3in. by 14in. to 20in., £8 5in.; 3in. by 13in., £8 5s.; 3in. by 10in., 12in., and 13in., £10 15s.; 3in. by 12in., £8 15s.; 2in. by 5in., £6 15s.; Third selected, 3in. by 11in., £13 10s.; 3in. by 7in., £10 10s.; 3in. by 3in. and 4in., £4 15s. Fourth, bright, under cover, 3in. by 9in., £10 5s.; 3in. by 8in., £9 15s.; ordinary, 3in. by 12in. to 18in., £7 5s.; 3in. by 13in., £6 5s.; 3in. by 11in., £6 5s. to £8 15s.; 3in. by 10in., £6 to £8 15s.; 3in. by 9in. to 17in., £6 to £7 10s.; 3in. by 8in., £7; 3in. by 7in., £7 5s.; 3in. by 6in., £6 15s.; 2in. by 9in. to 14in., £6 10s.; 2in. by 7in. to 8in., £6 10s.; 2in. by 4in. to 6in., £5 5s. The relative values of Red Pine (*P. Resinosa*) and Yellow Pine (*P. Strobus*) may be taken from the following prices:—First red, £18, first yellow, £21 15s., both being 3in. by 11in., and of the same class of goods in every way. Hitherto the logs of yellow pine imported here have always been hewn; but quite recently some logs sent to Liverpool are sawn. The timber in both logs is, of course, the same. In future sawn yellow pine logs will be as common in the market as sawn pitch-pine are in proportion to hewn logs.

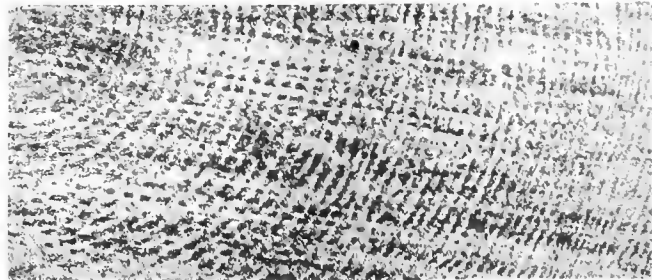
Canadian white spruce is imported from Quebec, St. John's, Dalhousie, Greenstone Island, Pentecost, &c. It and the black spruce (*Picea Nigra*), from which it is not distinguished in commerce, are characteristic trees of the Northern Forest Belt, which stretches along the north shore of Labrador to the 60° of North Latitude sweeping along the south of Hudson Bay and then north-westward into the Arctic Circle. The southern boundary of this forest reaches the 50° of latitude on the Atlantic Coast, and the 54° at the 100th meridian of longitude. It occupies 10° of latitude on the Atlantic seaboard, and extends for 20° north and south along the eastern side of the Rocky Mountains. To have clear ideas as to the districts in which American building timbers are grown, it is necessary to be acquainted with their general divisions, as agreed to by practical foresters there. All the North American forests are classified as belonging either to the Atlantic or Pacific Regions, the Rocky Mountains separating one from the other; the climate and meteorological influences to which trees are subjected being so different to the east and west of the range, that characteristic trees distinguish each region, which is again subdivided into "belts" or "forests" where certain trees only attain their greatest development under favourable circumstances. The Atlantic Region is made up of five distinct forest belts, which stretch across the continent from the Atlantic to the Rocky Mountains, the boundaries between them having a general trend almost due east and west. (1) The most Northern Forest Belt is that in which the white and black spruces are the characteristic trees. (2) The next great division is the "Northern Pine Belt" with black spruce to the north and Yellow Pine (*P. Strobus*) as the characteristic timber tree distributed over the entire area. (3) The "Southern Maritime Pine Belt" lies chiefly towards the Atlantic seaboard, and it is distinguished for its Cypress (*Taxodium Dis-*

tichum) and Pitch Pine (*P. Palustris*). (4) The Deciduous forest of the Mississippi and Atlantic plain is remarkable for its oak, hickory, magnolia, and ash, with the Pitch Pines (*P. Palustris* and *P. Mitis*), which attain their greatest development here. Red Cedar (*Juniperus Virginiana*) is also a characteristic tree of this division, and it should not be confounded with another red cedar, the wood of *Thuja Gigantea*. (5) The last forest division in this region is the sub-tropical forest of Florida and South Texas, the principal tree in which is the Mesquit (*Prosopis Juliflora*). It yields a hardwood used extensively for beams and underpinning, and has the reputation of being almost indestructible in contact with fire. The Pacific region is divided into two forests, the "Northern" and the "Coast," White Spruce being the characteristic tree in the former. The characteristic trees of the latter vary with the latitude; between 50° and 61° the trees which grow best are the Alaska Cedar (*Chamaecyparis Nutkaensis*), the Tideland Spruce (*Picea Sitchensis*), and the Hemlock (*Tsuga Mertensiana*), the "Oregon Pine" (*Pseudotsuga Douglasii*), and the Red Cedar (*Thuja Gigantea*) are also well developed here. As the Coast Forest ranges south other trees take the places of those already enumerated, another "Yellow Pine" (*P. Ponderosa*) appearing, and farther south still the Sequoia "Red Wood" trees are found. The Northern Forest Belt in which the spruces are found is subject to a copious rainfall, the country is divided by innumerable streams and lakes, and there are swamps of great extent, the low mean temperature checks growth, and along the northern boundary of this entire region the forest is scattered and stunted, the trees being of no commercial value whatever. No other arborescent trees are found growing with the spruce in high latitudes. Farther south in this northern forest the spruces are found growing in low wet soil near swamps and lakes, and they are, undoubtedly, the most important trees in the American sub-Arctic forests. In favourable situations they attain a height of close on 150ft., with a diameter of 3ft., but they are usually not more than 50ft. in height, with a diameter of about 18in., the black spruce (*Picea Nigra*) an associated variety, is a smaller tree; both are cut together for "lumber." It is by no means an easy matter to distinguish the sapwood in these spruces, as it dries like heartwood; the fine small knots will sometimes knock a gap in a highly-tempered plane-iron quite as efficiently as a cut brad, they are so hard. Yet the wood itself, though close and straight-grained, is not strong; finished with a well-sharpened smoothing plane, the surface is satiny, and there is a marked absence of resin ducts which are so numerous in other conifers. The wood is light, a cube foot weighing only 25½lb. There are two other white spruces in North America—*Picea Engelmanni* and *Picea Pungens*; the latter is also known as "blue spruce." It is a rare local variety, never found forming forests; specimens are from 90ft. to 130ft. high, and from 18in. to 30in. in diameter. *Picea Engelmanni* is the most valuable timber tree in the Central Rocky Mountains, above 8,500ft. In Washington Territory, Oregon, and Montana it grows to a small size only, whilst at extreme elevations, it is reduced to a mere prostrate shrub; in the lower districts, however, it forms extensive forests, some attaining a height of 140ft., with a diameter of 48in. The following prices are now obtained for Canadian spruce deals in London. First: 3in. by 11in., £12 15s. to £14 10s.; 3in. by 9in., £11 15s.; 3in. by 7in., £12 10s.; 3in. by 6in., £11 15s.; 2in. by 8in. and 9in., £12 15s.; 2in. by 7in. and 10in., £12 10s.; 2in. by 7in., £12 15s. Second: 3in. by 9in. to 11in., £10 to £10 5s.; 3in. by 9in., £9 15s.; 3in. by 8in., £8 to £8 5s.; 3in. by 7in., £7 15s. to £8; 3in. by 5in., £7 to £7 5s.; 1in. by 11in., £10 10s.; 1in. by 9in., £10. Third: 3in. by 11in. £9 10s. to £9 15s.; 3in. by 9in., £9 to £10; 3in. by 8in., £8 to £8 5s.; 3in. by 7in., £7 10s. to £7 15s.; 2½in. by 9in., £8; 2in. by 7in., £7 10s.; 2in. by 6in., £6 15s.; 2in. by 5in., £6 10s.; 3in. by 11in., £9 10s. Fourth: 3in. by 11in., £8 to £9 10s.; 3in. by 9in. and 11in., £7; 3in. by 10in., £7 15s.; 3in. by 9in., £8 10s. to £9 15s.; 2in. by 7in., £10s. Qualities are sometimes sold mixed. For example, First, Second, and Third together are worth: 3in. by 11in., £7 10s. to £8 5s.; 3in. by 10in., £8 5s.; 3in. by 9in., £8; 3in. by 7in., £7 5s. to £7 10s.; 3in. by 5in., £6 15s.; 2½in. by 7in. to 10in., £6 10s.; 2in. by 9in., £3 10s.;

OREGON FIR



OREGON FIR



RED PINE (CANADA)



RED PINE (CANADA)



WHITE SPRUCE (CANADA)



WHITE SPRUCE (CANADA)



YELLOW PINE (CANADA)



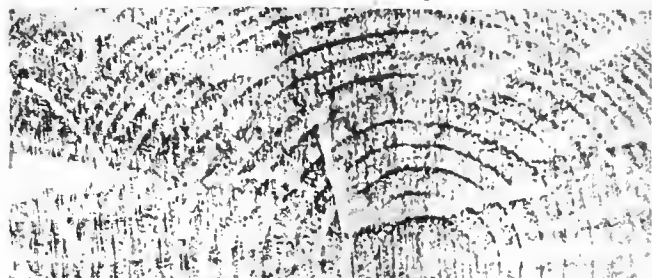
WHITE SPRUCE (CANADA)



MEMEL "YELLOW"



MEMEL "YELLOW"



NATURE-PRINTED WOOD SECTIONS.—(SHOWING ANNUAL RINGS).

Five-eighth Actual Size (Linear Measurement).

2in. by 6in., £7. Unsorted: 4in. by 8in., £8 10s.; 3in. by 8in. and 11in., £8 5s.; 3in. by 8in., £7 10s.; 3in. by 7in., £7 15s.; 3in. by 6in., £7 5s. to £7 10s.; 2in. by 6in. and 9in., £7 5s.; 2in. by 4in. and 6in., £7; 2in. by 6in., £6 5s. The commonest lengths for yellow pine deals are 9ft. to 18ft; red pine deals, 11ft. to 18ft.; and spruce deals, 11ft. to 16ft. A wood sometimes imported with spruce is hemlock, but it is not extensively used here, being coarse-grained, brittle, and difficult to work, which makes it

unfit for joinery; as it is also a weak timber, it should never be used for joists. The botanical term is *Larix Canadensis*.

The accompanying nature-printed sections, reduced by photography, give a good idea of the relative widths of annual rings in various timber trees.

It will be noticed that in every case the rings become narrower as they recede from the centre of the tree; in trees of the same species the whole series of rings may be much narrower in

one tree than in another, and coarseness or fineness of grain is not a characteristic feature of any one species, whether grown in Europe or America. The sections of Red Pine, Yellow Pine, and White Spruce illustrate much of the matter in this and the previous article. On the top of the series a lineal inch has been drawn divided into eighths, which has been reduced in the same proportion as the sections. The relation of ring width to annual growth will be noticed in another article.

Building Intelligence.

OVERSTONE.—On Tuesday week the parish church of Overstone, near Northamptonshire, was reopened after restoration. The church, which is dedicated to St. Nicholas, was built in the year 1893. The alterations and additions, carried out in Weldon stone, consist of a south aisle, organ chamber, vestry, and porch; the tower (which was much dilapidated) has been reroofed, and new battlements and windows provided; the bells have been rehung, and an additional bell added. The works generally have been carried out in the best possible manner by the estate workmen, from plans and under the superintendence of Mr. J. Mander, architect, Overstone Park.

SCARBOROUGH, KENT.—The new schools erected for the Southborough School Board at High Brooms were opened by Sir Spencer Walpole last week. They are in two departments, and accommodate 252 boys and 220 infants, with an addition to the boys' seats being arranged so as to be overlooked from the central hall. Two scholars will sit at each desk, and there will be a space between the desks for physical exercises. The central hall is 54ft. by 26ft. The infants' school is similarly arranged, except that the long schoolroom has to be used for marching and drill, as well as teaching. The total cost will be about £7,500. The architect is Mr. C. H. Strange, and the builders are Messrs. Strange and Sons, of Tunbridge Wells, and Mr. H. Elwig was quantity surveyor.

CHIPS.

One of the last acts of the Pope before his illness was to order a commission of great artists and architects to examine into the present state and condition of the paintings in the Sistine Chapel. The commission is presided over by the painter Ludwig Seitz. On the 3rd inst. the commission made a close study of the ceiling, and came to the conclusion that the work of consolidation must be begun immediately. At the same time, the commission expressed great satisfaction at the marvellous preservation of the immortal paintings, and the small injury the lapse of time had inflicted upon them.

A statue of the late Queen Victoria, erected in the square opposite the town-hall at Portsmouth, was formally unveiled on Wednesday. It has been executed by Mr. Drury, A.R.A.

The Health Exhibition in connection with the Sanitary Congress at Bradford was opened on Tuesday afternoon by the Mayor of Bradford. The exhibition is an exhaustive display of all sorts of hygienic and sanitary appliances. The president of the congress (the Earl of Stamford) delivered his presidential address the same evening, and on Wednesday and yesterday the business of the Congress began with the meeting of seven sectional conferences. Nearly 2,500 delegates are taking part in the proceedings.

The Bracebridge Urban District Council, at their last meeting, agreed to nominate the same arbitrator as Lincoln—Mr. John Young, manager of the Glasgow Tramways—in the matter of the acquisition of the tramways from the private company which now owns them.

Mr. Lawton R. Ford has been appointed by the London County Council as district surveyor for West Wandsworth, in succession to the late Prof. T. Roger Smith.

The important site at the south-east corner of Holborn and the Kingsway, facing the Holborn Restaurant and opposite the Baptist Church House, has been acquired of the London County Council for £50,000 by the Great Northern and Strand Railway Co.

On Friday the rector of Mundesley, East Norfolk, entertained the workmen who for the past six months have been employed by Messrs. Wilkin and Randall, contractors, of Mundesley, on the restoration of the parish church.

Mr. A. J. Brickwell has been appointed surveyor to the Great Northern Railway, in succession to Mr. W. H. Elwell, who has retired.

Extensive additions to the Warrington water-works were formally opened on Tuesday week. The sum of £135,000 has been spent by the corporation during the last four years on new supplies. Hard water for domestic purposes comes from wells at Winwick, and soft water for manufacturing purposes from reservoirs at Appleton, in Cheshire. Further extensions at Daresbury are in contemplation at a cost of £50,000 or £70,000. The works have been carried out from plans by Mr. T. Longdin, water and borough engineer.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

Telegraphic Address:—"Timeserver, London."
Telephone No. 1633 Holborn.

NOTICE.

Sound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LIII., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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* * Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—J. W. C.—B. M.—W. H. and Co.—E. A. D.—T. A. and Son.—D. E.—R. S. M.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Ogee," "Needlepoints," "Bon Bon," "Brassey," "Icicle," "The Kid," "Solo," "Lot."

Intercommunication.

QUESTIONS.

[11991].—**Dry Rot.**—Can any of your readers tell me if there is any remedy for dry rot? I have a workshop and office which is badly infected, and the fungus grows very quickly during the present hot weather. I have consulted an architect, who tells me that the only thing I can do is to have the whole of the flooring removed and remake with bricks or quarries; but a boarded floor is a necessity. Shall be glad of any information enabling me to take out infected parts and replace with fresh boards without fear of having a recurrence in a year or two's time.—ENGINEER, Coventry.

[11992].—**Valuations for Probate.**—Would one of your correspondents, through your valuable paper, be good enough to give me some reliable information as to the fees chargeable for valuations of properties for probate? I have searched numerous handbooks and other sources of information, but fail to find any definite scale whatever, and the few tables that mention valuations under this heading do not say if they are for property or effects, and they do not even then agree as to the amount to be charged. The valuation in this case consists of a number of freehold and leasehold properties situate in

the N. and N.W. districts, some distance from each other, and all different and requiring to be viewed and valued separately; also a large number of plots of building land (freehold) situate on different building estates varying from two to eight miles apart and some forty miles from London, and all varying in value. I should be glad to know what is the usual scale adopted for valuations of this description.—ENQUIRER.

REPLIES.

[11984].—**Plaster of Paris.**—Perhaps "Plastering," by W. Millar, contains as good account as any on plaster of Paris. Published at 18s. net, by E. T. Batsford, 94, High Holborn, W.C. Chapter II., "Materials. Also something in A. H. Heath's "Lime and Cements"; ditto "Calcareous Cements," by G. R. Redgrave; ditto "Lime, Mortar, and Cement," by W. J. Dibdin.—REGENT'S PARK.

[11985].—**External Plaster.**—Probably not, as moisture affects them more or less. See books on Cements at Patent Office Library, viz.: "Plastering," by W. Millar; "Lime and Cement," by A. H. Heath; "Lime, Mortar, and Cement," by W. J. Dibdin; "Calcareous Cements," by G. R. Redgrave.—REGENT'S PARK.

LEGAL INTELLIGENCE.

WHAT IS "PORTLAND CEMENT"?—At a special sitting of the Croydon Justices on July 2, the Associated Portland Cement Manufacturers (1900), Ltd., of Dixon House, Fenchurch-street, E.C., were summoned by Henry Poston, architect and surveyor, of 39, Lombard-street, E.C., for having, on March 28, sold to George T. Hall, of George-street, Croydon, dealer in building materials, two sacks of cement to which a false trade description had been applied—viz., "Portland cement," contrary to section 2 of the Merchandise Marks Act, 1887. Mr. Horace Avory, K.C., with Mr. H. C. Biron, was for the prosecution, and Mr. Spencer Bower, K.C., with Mr. A. H. Bodkin, for the defendants. Mr. Avory, in opening, said that in law it did not matter whether the stuff falsely described was just as good as that coming correctly under the trade description, nor was it necessary to say that the person who bought it had not paid more than it was worth. Defendants were a large combination of cement manufacturing firms, and his clients were cement manufacturers outside that combine. Complaints caused two sacks of defendants' cement to be purchased of Mr. Hall, and it was analysed by Messrs. Stainer and Blount, chemists, who had special experience with cement. They found that 13 per cent. of this so-called Portland cement was an insoluble residue of sand and clay. Cement consisted of a mixture of chalk and clay in certain proportions, subsequently burnt in a kiln and finely ground. The real Portland cement was of an extra good quality, calcined so completely that but 1 per cent. of insoluble matter remained, accounted for by an unavoidable accumulation of dust in the process of manufacture or subsequent transit. The excess of insoluble residue in defendants' cement must have been added to increase the bulk and improve profits. Now what was Portland cement? In 1893, after three years' investigation, and to make no mistake about it, the Cement Traders' Section of the London Chamber of Commerce passed some resolutions. One was to this purport—"That Portland cement be defined as a mixture of two or more suitable materials, intimately and artificially mixed in the requisite proportions, and afterwards properly calcined and ground, to which nothing has been added during or after calcination excepting that an addition not exceeding two per cent. of gypsum is permissible for the purpose of regulating the strength." Further, it was also resolved that if anything beyond the gypsum were added the product was not to be sold as Portland cement, but under some other distinctive name. These resolutions were signed by numerous firms, of whom nineteen had since joined the defendants' combination. Therefore these facts Mr. Avory claimed to be to an extent an admission on the part of the defendants, and could be used against them. Evidence was given by Frederick Blyton, builder, 122, Kennington-lane, as to purchasing the two sacks of cement of Mr. Hall at the instance of Mr. Poston, on whose behalf he had also made similar purchases in other districts. Mr. Poston, in cross examination, declined to admit that two applications for a similar summons had been refused in the City by the Lord Mayor. Asked the names of the firms behind him in the matter, the witness objected, and the Bench ruled that the responsibility of answering was entirely a matter for himself; he declined. Cement which contained 13 per cent. to 25 per cent. of ground Kentish rag was not "Portland cement" in the trade meaning of the term. It was not the custom of the trade to accept as Portland cement any cement which contained more than 2 per cent. of gypsum. Mr. Bower: Does "Portland cement" in the trade mean any adhesive substance which, when in finished use, presents an appearance resembling, and has all the properties of, the stone known as Portland stone? Witness emphatically declined to accept this definition. "Portland cement" had a distinct trade meaning, in contrast to other kinds of cement. Mr. Bertram Blount,

F.I.C., M.S.P.A., deposed as to the analysis, and said he understood that Portland cement, as known to the trade, was simply chalk and clay calcined and then ground. It did not admit of anything being added, as it was then a finished material. Sir Alexander Binnie, Vice-President of the Institute of Civil Engineers, gave the opinion that the substance analysed by Mr. Blount was not Portland cement as generally known in his profession. He was aware that gypsum was added by some manufacturers, but he had never passed cement in which he knew it had been used. He did not know till he entered court that morning that English commerce had fallen so low as to add 13 per cent. of foreign substance to what was sold as Portland cement. It passed his comprehension how a body of manufacturers could come forward and boldly admit adding 13 per cent. of ragstone and call it Portland cement. Mr. Charles Neike, M.Inst.C.E., agreed with Sir Alexander's opinions. Mr. G. T. Hall said the cement in question was part of a large consignment. Having heard all the evidence, he felt that it could properly be described as Portland cement. The defence, as foreshadowed in the cross-questioning of witnesses, appeared to be that the inclusion of Kentish rag before grinding made the cement equal and even better than Portland stone, and would answer all the tests that could be given that stone; that in the strict trade understanding of the term it was Portland cement. Mr. Bower raised the question of jurisdiction, and it transpired that Mr. Hall carted the cement from Deptford. The defence urged that the actual sale took place there, and consequently the Croydon Bench had no jurisdiction. Mr. Hall said he received the invoice at his Croydon office. Mr. Avory submitted, therefore, that the contract was made in Croydon. The Bench retired, and on returning said that when the information was laid they were given to understand that the actual sale took place in Croydon. They now found it was completed at Deptford, and under the circumstances could exercise no jurisdiction in the case. Mr. Avory asked the Bench to state a case on the question of jurisdiction, should he think it worth while to appeal. The Bench agreed, and in dismissing the summons on the question of jurisdiction alone, made no order as to costs.

RAILWAY COMPANIES AND THE PUBLIC HEALTH ACT.—At Marylebone on June 15, Mr. Curtis Bennett had before him the case of the Hampstead Borough Council v. Tennant. The latter traded as Isaac Tennant and Co., builders, of Grange-road, Willesden-green, and had to answer seven summonses in respect to certain sanitary work done by them at the Finchley-road Station of the Metropolitan Railway. It was urged that the railway company were not amenable to the local authority; but the magistrate decided against them, and consented to state a case. The facts were reported in our issue of June 19, p. 877 last volume. An intimation was given on Saturday that the company were content to accept the magistrate's ruling, and that the case would not be proceeded with.

NIDD VALLEY ARBITRATIONS.—WINN AND THE BRADFORD CITY CORPORATION.—Lieut.-Col. W. H. Wellsted, C.E., the umpire in the above matter, has just issued his award, amounting to £14,585. The claim was in respect of 1,115 acres of leasehold land in the Nidd Valley taken for the construction of reservoirs and gathering ground for the Bradford Corporation Waterworks, and amounted to £28,220, whilst the value placed upon it by the corporation witnesses was £7,973. The arbitrator for the claimant was Mr. Thos. Fenwick, C.E., Leeds, and the witnesses were Messrs. C. R. Fenwick, W. B. Boord, John Maughan, Richard Horsfall, W. F. Tempest, and John Farrar. The arbitrator for the Bradford Corporation was Mr. Chas. Gott, C.E., Bradford, and the witnesses were Messrs. Fredk. Fowler, W. B. Woodhead, R. B. Broster, and George Runtou.

TENDERS AND DEPOSITS.—At the Liverpool County-court, on Friday, before his honour Judge Shand, Messrs. John Ainscough and Son, contractors, Oldham, sued Messrs. Beloe and Priest, civil engineers, Harrington-street, Liverpool, for the return of £5 5s, being a deposit on quantities and specification for the Fender Valley sewerage, in course of construction by the Wirral sanitary authority. A representative of the plaintiff firm stated that he saw an advertisement asking for tenders for the work, specifications and quantities to be obtained at the office of Messrs. Beloe and Priest on payment of £5 5s., which would be returned on the receipt of a *bona-fide* tender. He called there, got the specifications, and paid five guineas deposit. Subsequently, his firm's tender was accepted; but he found out that the specifications contained a proviso as to sureties for the carrying out of the work which he could not comply with. He declined to sign the contract, and ultimately applied for the return of the deposit, which was refused. For the defence it was stated that the deposit was forfeited by reason of the conduct of the plaintiffs, whose tender had not been *bona-fide*. They saw the specifications containing the proviso as to sureties, and they tendered knowing that they objected to the condition. Judge

Shand held that the plaintiff's tender was a *bona-fide* one, although they were unable to go through with it owing to the clause as to sureties. They might have been negligent in not reading the specifications, and the defendants might have been put to expense thereby, for which they might have a claim for damages. Judgment would be given for the plaintiffs, with costs.

BUILDING BY-LAWS.—APPEAL DISMISSED.—The Leeds Stipendiary, having ruled, in the case taken against Messrs. Haste and Brown, of the Hough End Tannery, Bramley, that where the floors of workshops are constructed with joists resting upon girders of steel, the requirements of the city by-laws do not require joists of the strength indicated by By-law 58, the Corporation appealed, and the appeal came before the King's Division of the High Court on Friday. The Court dismissed the appeal with costs, being of opinion that the by-law was intended only to apply to premises with wooden joists, girders, &c.

CHIPS.

The Duke and Duchess of Connaught visited Walthamstow on Saturday afternoon to open a new wing of the Children's and General Hospital for Leyton, Walthamstow, and Wanstead. The new wing, which consists of an out-patients' department with dispensary, an operating theatre with anaesthetic room, and a ward with fourteen additional beds.

A new drive and roadway along the cliffs connecting Birchington and Westgate-on-Sea was formally opened on Thursday in last week.

At the last meeting of the Education committee of the Southampton Corporation it was decided that the office held by Mr. J. H. Blizard, of that town, as architect to the late school board, be abolished, and that Mr. Blizard be requested to forward particulars of his claim for compensation under the Education Act.

The baths committee of Dundee Town Council are completing negotiations for a site for a new public washhouse and baths for the West End. The building will cost between £6,000 and £7,000. The central washhouse is to be improved at a cost of over £1,200.

The Salford Town Council have confirmed the recommendation of the building and bridges committee to approve the acceptance by the Manchester Corporation of a tender for the reconstruction of Prince's Bridge at a cost of £10,374, one-half of the cost to be borne by the Salford Corporation.

In view of the increasing responsibilities which will attach to their officials owing to the adoption of the Esholt sewerage scheme, the sewerage committee of the Bradford Corporation propose to create a new position, which will rank next to that of Mr. Garfield, the chief engineer, with a salary of £225 per annum.

On Saturday the foundation-stone was laid of a new church at Marsden Colliery. The church, which is being built from plans prepared by Messrs. J. Potts and Son, architects, Sunderland, will consist of nave, chancel, and vestry, and there will be a bell-turret on the west gable. The nave will contain sitting accommodation for 200 persons. Marsden limestone with freestone dressings will be used in building the outer walls, and the seats and other internal fittings will be of pitch-pine. Mr. W. D. Allison, of Whitburn, is the contractor.

Mr. Choate, the American Ambassador, will unveil the Emerson marble bust, and Mrs. Humphry Ward will unveil the James Martineau marble bust—both by Mr. George Frampton, R.A.—at the Passmore Edwards Settlement, Tavistock-place, on Thursday in next week, the 16th inst., at half-past three.

On Saturday afternoon the members of the Darlington Corporation attended at the opening of North Lodge Park, which had been purchased, and will cost, with the laying out, including a bowling-green and grand stand, rather over £13,000.

The urban district council of Walker-on-Tyne have instructed their surveyor to prepare plans for municipal offices and a fire-brigade station.

The tents occupied by the timekeepers and route guardians of the Gordon-Bennett Cup Race were supplied by the Willesden Paper and Canvas Works, Ltd., and also the flags—triangular and square—having direct signalling significance were made of Willesden paper.

At St. Saviour's, Southwark, on Friday, the Bishop of Rochester unveiled and dedicated a memorial window to the late Mr. James Frederick Field, surveyor and auctioneer, of Borough High-street, who was assistant treasurer of the Collegiate Church and member of the chapter. The window, which is in the north aisle, represents St. Augustine, Bishop of Hippo (354-430). It is designed by Mr. C. E. Kempe. The corresponding window in the south aisle was the gift of the late Mr. Field in memory of his father, and represented St. Switwin, who founded the Collegiate Church.

COMPETITIONS.

BLACKPOOL.—Some time ago the town council invited competitive designs for a new technical school to be erected on the Ruikes Hall estate at a cost of about £17,000, and after going through the various plans submitted, the awards have been made as follows:—First premium (£50), Messrs. Potts, Son, and Pickup, Bolton; second, Messrs. Cheers and Smith, Blackburn; third, Messrs. Simon and Crawford, Manchester. Messrs. Potts, Son, and Pickup were the architects for the new town-hall at Blackpool.

STOKE-ON-TRENT.—Applications for the appointment of an architect and surveyor to complete certain work at the workhouse hospital, the erection of a new mortuary, and the conversion of the existing building to other purposes, together with the modified scheme providing for certain alterations and additions at the workhouse, in respect of which plans had already been prepared and approved, were considered by the Board of Guardians in committee on June 25; and out of 24 candidates the following six gentlemen were selected to be interviewed by the Board:—Messrs. J. T. Brealey, Hanley; E. Jones, Hanley; A. P. Miller, Hanley; A. R. P. Piercy, Stoke; R. Scrivener and Sons, Hanley; and T. Tindal, Longton. At a subsequent meeting of the board a letter from Mr. Lynam, the architect who had prepared the plans, was read, asking whether the board would allow him to complete the quantities for the work, and pointing out that in any event he was entitled to his remuneration in full; but the committee recommended that his request be not acceded to. The voting for the appointment resulted in favour of Mr. A. P. Miller, whose terms for completing the building work in hand were 2½ per cent. on the outlay, which is estimated at £14,250.

The new Northern Cemetery for Salford at Agecroft was opened on Friday by the mayor of that borough. It has been laid out, and the buildings have been erected from plans by Messrs. Sharp and Fester, architects.

The mosaic in the entrance to the Ulster Hall, Belfast, into which is introduced the Belfast coat-of-arms, has been laid by Diespeker, Ltd. This firm is also laying the mosaic in Purdysburn Asylum, near Belfast, both contracts having been secured in competition with other firms.

The opening of a new wing of the Darlington Female Training College took place on Friday. The additions have cost £5,600, and have been carried out from plans by Mr. Pritchett, of Darlington.

On Friday the opening took place of the new Hastings Wing of the Queen's School, Chester, which has been built at a cost of about £2,000 from plans by Mr. E. A. Ould, of Liverpool.

The top stone of the central tower of Truro Cathedral was laid on Friday by Mr. S. M. Dennis, son of the donor of the tower, Mr. James Dennis, of Grenehurst Park, Surrey. The vane was placed in position by Mr. E. T. Price, the clerk of works. The tower will cost £15,000. Except for the two western towers, which are estimated to cost £7,000 each, and will not be proceeded with until the cost is offered to the cathedral authorities, Truro Cathedral is now complete. The nave will be formally opened by the Prince of Wales on the 22nd inst.

The additions to the Borough Sanatorium, Brighton, are being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves in richly glazed faience, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Hampstead Borough Council will consider, next week, a recommendation from a special committee that the plans for the alteration and extension of the town-hall, at an estimated cost of £7,972 for building works and £2,000 for additional land, as prepared by Mr. John Murray, F.R.I.B.A., be adopted.

At the next meeting of the West Riding County Council it will be proposed that the department of the surveyor and architect be divided, and that Mr. J. Vickers Edwards remain the architect at £1,500 a year, and that he give the whole of his time to the duties of the office.

The death is announced from Yealmpton, Devon, of Mr. William Drake, of the firm of Messrs. Cowley and Drake, of Willesden Green, N.W. Mr. Drake, who was in his fiftieth year, had been unwell, and was staying at his native village when he died. Among the works carried out by the firm are the Passmore Edwards Cottage Hospital, the Court House of the Middlesex County Council, and some board schools, all at Willesden, and many buildings in London and its vicinity.

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ILLUSTRATIONS.

HARROGATE PUBLIC BUILDINGS.—LIVERPOOL CATHEDRAL DESIGNS.—PASSMORE EDWARDS ADMINISTRATIVE BLOCK, CHALFONT.—SEACROFT GOLF LINKS HOTEL, SKEGNESS.

Our Illustrations.

HARROGATE MUNICIPAL BUILDINGS.

MR. HENRY T. HARE, F.R.I.B.A., is the architect of this building, but no further particulars are to hand.

LIVERPOOL CATHEDRAL: SELECTED DESIGN.

This sheet of details, giving a bay of the choir and a bay of the nave of this great church, shows the purity of the Early style adopted by Mr. G. Gilbert Scott, while the touch of Flamboyant fancy in the tracery of the windows imparts a degree of freedom hardly observable in the general drawings already published during the past month or so in our pages. The bay of the nave illustrated is one of the low ones which occur between the dormered bays called transepts, and which correspond with the high bays of the choir in their general proportion. The single-page plate herewith given shows the choir end and tower and spire of Mr. Malcolm Stark's proposal for the same building. We have already illustrated in detail the entrance end of his design, and given his plan.

THE PASSMORE EDWARDS ADMINISTRATION HOUSE AT THE COLONY FOR EPILEPTICS, CHALFONT ST. PETER.

This building, which is intended to serve as a central administration house for the colony of the National Society for Employment of Epileptics, has lately been commenced, and the foundation-stone is to be laid on the 21st inst. by Sir William Broadbent. The plans have been prepared by Mr. Charles Grieve, of Lumb Building, Temple, E.C., and in view of the fact that the population of the colony—at present about 200—is constantly increasing, the building has been designed specially with a view to facility for enlargement to meet future needs. The accompanying drawing shows the house as it is now being built, with the addition of a committee-room and staff dining-room which are likely to be added at an early date. The building is situated in a central position, the men's department of the colony being near at hand on the right, and the women's department on the left, while the future homes and schools for children will be in the rear. The accommodation on the ground floor comprises, in the front of the house, the matron's sitting-room, and office on either side of the hall. The committee-room and staff dining-room, when added, will form a right and left wing respectively, and will be approached by the transverse corridor. A passage through the centre of the building leads from the hall to the kitchen, and has on the one side a lavatory, a dispensary, and a general store-room; and on the other a pantry, sewing-room, and linen store, and assistant matron's room. The kitchen is intended to serve as the central kitchen of the whole establishment, and behind it is a covered space for the trolleys in which the cooked food will be conveyed to the various homes. The larder and milk store will be partially underground, and over them will be a boot-room. The upper floor comprises bedrooms and other accommodation for the matron, assistant matron, servants, and visitors. Near to the administrative house, on the left, is the laundry, and amongst future developments of the colony it is pro-

posed to erect between these two buildings a water-tower and also a power-house, wherein steam will be furnished for cooking and laundry purposes, and wherein electricity will be supplied to the various homes and other buildings of the colony for purposes of light and power. The entire cost of the building now in course of construction will be about £3,000, and this sum will be provided by a donation from Mr. J. Passmore Edwards, who, it may be mentioned, has already given for the purchase of land and erection of homes at the colony, contributions amounting in the aggregate to £15,500.

SEACROFT GOLF LINKS HOTEL.

This building was designed by Messrs. Brewill and Bailey, architects, Nottingham.

Our Office Table.

THE premises of the Royal Architectural Museum, in Tufton-street, Westminster, have, after unexpected delays, now formally passed into the possession of the Architectural Association, and tenders are being invited by the committee for carrying out the necessary alterations in accordance with the plans prepared by Mr. Leonard Stokes. Several changes in the personnel of the A.A. Day School, now conducted at 56, Great Marlborough-street, are about to take place. Mr. Arthur T. Bolton, who has rendered excellent service in the initiation and conduct of the school as headmaster, is relinquishing the post on the completion of the two years for which he was appointed, and the committee have nominated as his successor Mr. H. P. G. Maule, who has been one of the honorary secretaries of the Association for the last two years. Mr. Louis Ambler, late vice-president, will succeed Mr. Maule in the post thus vacated. The annual excursion of the Association will be held during the week after next, from Monday, the 20th inst., until the following Saturday, the 25th. Worcester, as in 1881, will be the headquarters, and among the places to be visited are Mere Hall, Huddington Court, Westwood, Eastington House, Birt's Morton Manor, Great Malvern Priory, Hampton Lovett, Harrington Hall, Chaddesley Corbet, Grafton Manor, Bredon, Overbury, Woollas Hall, The Littletons, and Evesham.

A TWO-DAYS' exhibition of drawings done by architectural students of University College, Liverpool, during the past session, under the direction of Professor F. M. Simpson, who is leaving Liverpool to accept a similar Chair of Architecture at University College, London, in succession to the late Professor Roger Smith, was held on Friday and Saturday in the architectural studio in the college. The drawings comprise the work executed by students of the advanced and junior design classes, and also first and second year students' work. The sets of drawings which gained first prizes for design in the evening advanced classes were those of T. Capstick and A. Landstein. They comprised a series of elevations, plans, &c., of five cottages, an artist's house, a chancel to a town church, a small school, a summer residence, a fireplace in a dining-room, a golf clubhouse, and a pair of semi-detached houses. Honourable mention in these subjects was awarded to F. Wrennall. The chief features of the first and second year students' drawings are the designs for a small country house by J. G. Birch and Baruish; whilst an essay by the latter on the Renaissance architecture of Italy, France, and England attracted interest by the exhaustive series of drawings which ran through its pages. Another contribution of this nature is the work of K. Cameron. Prominent, also, are the drawings, of last year, by L. P. Abercrombie. They include designs for a staircase, a country house, and a gallery, and are severely Classic in character. A country house by Mr. Quiggin (last year), together with drawings of shops with offices over them, and a stable, are also hung. In the junior class drawings, the first prize is taken by J. W. Cabre with a staircase, semi-detached houses, dining-room decoration, and a country inn; and the second prize by P. Dawson with a small lodge, decoration for dining-room, and a semi-detached house. Honourable mention in this department was gained by J. Pearce. The work executed by the second-year day students includes staircases, windows, domes, billiard lanterns, and examples in Gothic architecture, the special subject being the Pilgrims' Chapel at Highton-le-Dale.

WITH reference to the County-court case from

Salford reported in our last issue, p. 30, where Judge Parry made strong remarks as to the practice of furniture dealers describing as "solid walnut suites" articles only veneered with that wood, Mr. James Shaw, of Manchester, points out that some years ago furniture was entirely made by hand, and the exterior or polished parts of most of the walnut furniture then manufactured was made of common deal or pine, veneered over with walnut. Invariably this class of furniture was extremely poor in quality, and the term "veneered" became a term of reproach. To-day machinery enters largely into the construction of the finest class of furniture. Veneered work cannot be done by machinery, therefore the solid wood must be used in all good-class machine cabinet-work, and the furniture so made is distinguished from veneered furniture (which is still made in small quantities) by being termed "solid walnut." It is, he says, a surprise to the whole trade to know that the term "solid walnut" is understood to mean "all walnut." Most people, he adds, know perfectly well that a piece of walnut-wood furniture is not wholly composed of walnut, any more than a suit of broadcloth is wholly composed of broadcloth.

Trade News.

WAGES MOVEMENTS.

BURTON-ON-TRENT.—Mr. A. A. Hudson, barrister, who recently sat as arbitrator in reference to the claims of the Burton builders' labourers for an increase in pay of from 5½d. to 6d. per hour, has given his decision. He awards the men another farthing, and this will be binding for three years.

CHIPS.

The new English Presbyterian Church at Wepre, Connah's Quay, was formally opened on Friday. The building has cost £3,000. The architect was Mr. Smith-Ridgfield, Manchester, and the builder Mr. T. J. Ren, Connah's Quay.

At a meeting of the King's Norton and Northfield District Council, Mr. Harold F. Waller, assistant in the surveyor's department of the Sutton Town Council, was appointed building inspector at a salary rising from £120 by annual increments of £15 to £150.

Sir Samuel Montagu has placed at the disposal of the London County Council £10,000, for the provision of working men's cottages at Edmonton. The Council will build from 400 to 500 cottages.

A new Wesleyan chapel is being built in High Park-road, Southport, from plans by Mr. F. W. Dixon. It will accommodate 680 persons, and will cost £4,000. The foundation-stone was laid on Saturday last.

A new public school is about to be built in Hareham-road, Kingswood, Bristol, from designs by Mr. J. Mackay, of Kingswood. It will be Elizabethan in style, and will accommodate 930 children in three departments.

An assembly-hall with a dramatic license is about to be erected in the Town Hall-square at Rochdale. The contract has been taken by Mr. Thomas Hargreaves, of that town.

The light railway which connects Fraserburgh with the fishing villages of Cairnbulg, Inverallochy, and St. Combs was opened for traffic on Friday. The distance to Cairnbulg and Inverallochy is 3½ miles, and St. Combs 5 miles.

The parish church of St. Mary, Fordingbridge, Hants, was reopened by Bishop Webb, Dean of Salisbury, on Tuesday week, after restoration. The architect was Mr. C. E. Ponting, of Marlborough, and the contractor Mr. Kite, of Salisbury.

The inhabitants of Keighley are to be presented with a new clock and chimes, to be erected in the tower of the parish church. Messrs. Wm. Potts and Sons, clock manufacturers, Leeds, the makers of the Prince-Smith memorial clock and chimes, also at Keighley, have the work in hand.

Mr. Ernest Runtz states that in consequence of the death of Mr. Albert C. Breden, the name of his firm will in future be known as Ernest Runtz and Ford. Mr. Geo. McLean Ford, A.R.I.B.A., who has been associated with Mr. Runtz for upwards of twelve years, is now his sole partner.

The Whitehaven Rural District Council have adopted a scheme of water supply for the six parishes of Gosforth, Ponsonby, Haile, St. John's, St. Bridget's, and Lowside Quarter at an estimated cost of £13,800. There will be over 20 miles of mains. The scheme has been prepared jointly by Mr. G. Boyd, surveyor to the council, and Mr. Harry W. Taylor, A.M.I.C.E., Newcastle.

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MUTILATED BUILDINGS.

ONE of the obvious defects of modern architectural design is the want of solidity. A very large proportion of our commercial and public buildings comprise only one or two fronts, the remaining sides being roofed at a lower level, and presenting very irregular elevations, as if the cubical capacity could not be filled up, or that the scale of the plan was too large to admit of more than portions of it or one or two fronts being carried up above the ground story of the building. We are accustomed to see public edifices, especially churches, only partially completed. It is very usual to find a new church consisting only of a fully-built chancel, with a low-roofed, unfinished shed-like structure leading up to it at one end, or a mere corridor or shanty of corrugated iron; sometimes a partially-built nave without a chancel, indicating the relative importance attached to these parts by the promoters or builders; but such mutilated structures we can understand, awkward and ugly as they are for a long time. We regard them simply as incomplete structures, the same as we should a large public institution like a hospital or a school, where perhaps only one wing of the building is erected, presenting an unsymmetrical façade. But this argument does not apply to many buildings which are planned and designed as a dismembered whole, where perhaps the whole rear portion has been designed as a one-story building, or only built up in parts, while the main elevations to the streets are of several stories. The architect may tell us economy has been the chief object in this incomplete and often chaotic design, or that light to some of the interior corridors and rooms could not have been obtained in any other way than to top-light the rooms behind. Circumstances no doubt create conditions, and sometimes a top-lighted back area, as in a large shop area that occupies the whole dimensions of the land, is the only alternative. But this condition does not invariably apply. Perhaps a large plot of ground forms the site, with a street or streets on one or two or more sides, and the architect is not compelled to utilise the whole of the area. He has, then, his own choice. A certain accommodation or area is required. Two or more alternatives are open to him: he can cover the whole area with a one or two-storied building, or he can set apart a portion of the site for open spaces for light and air or for extension, and on the other portion of site he can erect a three or four or five-storied building, as necessity requires, over the whole area of such portion; or he can extend the limits by erecting a portion high and a portion at a lower level. He has thus freedom in making his building a solid-looking compact whole on either of the two first-named plans, or in designing a partial or mutilated structure. There are, indeed, some cases where circumstances compel the designer to adopt the partial or mutilated plan. One of these is when the site is closed in by high buildings on one or more sides at the back, or the existence of "ancient lights" in the adjacent premises. In one case the architect is often obliged to provide light areas or courts; in the other, to roof a portion of his building at a lower level to allow the dominant tenement windows to receive their light. These are conditions which compel the architect to adopt roofs of different levels, and thus to cut up his building in a most unsatisfactory manner. But with some architects these are not the only

reasons or exceptions. There is another reason. The designer is one who may be a skilful arranger of plans, but has no ability in grasping the whole in his mind, the plan and elevations. He can puzzle out his ground-floor plan with economy and skill, but he does not trouble to consider how that plan will affect his elevations or his roofing problem. These are matters he leaves to his elevations when he comes to them. If he wants a top-light for a corridor or some offices, he does not scruple to provide one, regardless of the consequence to his back elevation; any idea of rubbing out the scheme and thinking of another that will enable light to be got for the said offices by a small court area is out of the question—it involves too much trouble. To very few are given the gift of thinking in the solid, if we may so term it, of viewing the relation of plan to height and elevation, and it is this power—the modelling faculty, of seeing things in the concrete, or as they will appear when built—that is wanted in the architect. Some men are good as planners, others as elevation designers, but it is not often that we see the double or combined power, and no doubt it is this lack of seeing all round at once, if we may say so, that makes the art of architecture so much more difficult and complex than those arts where the attention is confined to surfaces, as in drawing and painting. The designer of buildings ought to be able, after he has sketched out the plan of his room with its windows, and door, and fireplace, to imagine its effect when built in its height and proportion, and how it will appear in connection with the corridor, or lobby, or anteroom, and he should further be able to realise in the mind's eye the external appearance. In planning, the mind is engaged in one operation in laying down on a horizontal plane the lengths and widths of rooms and corridors, a section of the building at a certain level; the great importance of the operation may be an excuse for neglecting to consider the third dimension, or height of the various parts. Yet the art of arrangement can only be very imperfectly performed unless the designer keeps in his mind the main internal divisional walls which go up and form the masses of the building, and not the least the scheme of roofing above. These main walls must always control the divisions or spaces between them, as we notice in the best plans; whenever they are disregarded the composition or external grouping fails.

The distinct treatment of plan from external design has almost come to be regarded as a merit instead of a vice by many in the profession. Probably it arises from the false separation of the useful from the beautiful in architecture. Subdivision of the architectural functions has much to do with it. The specialists who have made certain kinds of building their study are strong in plan, and often regard the elevations with indifference. It is common for the architect who makes a clever plan to engage a draughtsman, or "ghost," to draw the elevations for him. We can hardly expect separation of plan and design to produce solid and coherent buildings, because each artist has been working regardless of the other. The expert in plan has arranged his departments and rooms, quite unheeding how they can be treated or grouped externally, while the elevation draughtsman tries to ignore any part of the plan which does not lend itself to his preconceived idea. So it has happened that the two parts of the design do not form one coherent whole, and the profession give themselves up more to the particular part of the work they like best. In a great many buildings plan is all-important, and elevation does not count for much, so it is not studied with all the attention it ought to be. Take a competition set of designs for a town-hall and offices, in which a good plan is the

main consideration. Very few of the designs show a study of the building in its completeness; they are either strong in plan or elevation. But we notice more particularly a class of designers who, while they send in good plans, make a wreck of their elevations: those who mutilate their designs by cutting down the upper stories in the most reckless fashion. They send in one good elevation, but all the others are mutilated. Thus, after turning one corner of the front, the other front drops down suddenly to perhaps the ground story, leaving the façade a mere mask of perhaps one room, behind it a waste of skylights and flats. These would provide top light to certain official departments and corridors in the rear. More solidity can be obtained by carrying the stories of the front round at the side, so that a view of both fronts would not disclose the low-storied part. The back elevation of such a design, if there is any shown, is very unsightly and undignified. It shows an ill-assorted row of skylights and lanterns and chimneys of all sizes and heights. Behind the ambitious façade, towards the main street, the illusion of dignified architecture is suddenly dispelled by a bare wall rising above the ground story flats. There are many odd-shaped and unsightly projections. Could there be anything more shocking to the nerves of the sensitive artist than such an utterly sham building? We cannot call it architecture. It is really the masking of a one-story structure with façades; in one or two competitions we saw lately the ground story, top lighted, exceeded in area the portions of the design carried up. In a design for a bath or washhouse the low-storied or top-lighted area naturally preponderates, while a second story structure for slipper baths, caretaker's rooms, &c., becomes necessary in town sites. Also in the case of a public library on a closed site, the reading and newsrooms are often better lighted by lanterns or top lights, and even a portion of the leading department may be so lighted, the upper stories in front and sides being set apart for reference, store-rooms, or librarian's rooms. In a town-hall the large assembly-hall, if on the ground floor, is better top lighted, and the same mode is desirable for the council chamber and magistrates' courts. For large bank apartments, halls, and vestibules or corridors there are decided advantages in dark town sites in adopting the same method; but the architect should not lose sight of the external design, and endeavour to confine these top-lighted or low-story areas to the inner portion of the site, leaving a solid range of storied buildings on the main sides at least. On a restricted or town site this solidity and compactness is more necessary than on an open country site, if we desire to preserve an architectural character. Notwithstanding this, the necessity of top lighting increases in towns according to the density of surrounding buildings; just in the same proportion as the necessity of increasing the number of stories. These concurrent facts add greatly to the difficulty of interior planning. Luckily, however, the restricted town area lessens the desirability of lighting large interior rooms, and the smaller the area the more easily can the rooms be lighted through windows in the outer walls. In short, the less the building area, the greater the necessity of increasing the height of the building, and the greater is the value of top-lighting on the ground floor. The light well or shaft becomes a necessity in such cases to avoid illuminants. The only other method is the Luxfer Prism method of radiating or diffusing daylight. On the other hand, the larger the building area the less the necessity of height, and the less the apparent value of top-lighting. In fact, the problem of the relation of size of building area to lighting and to architectural solidity is a very important one to the architect. Compactness and solidity are best attained, therefore, in towns where

space is limited. There are certain evils to be avoided where the half-solid and half-single storied method of building is adopted. One is the introduction of architectural features, as in a façade made up of gabled storied wings or pavilions towards the main front. If this front extended only one room in depth, the side or perspective effect would be aggravated, for it would reveal these features cut down as it were at every little depth from the front, whereas features of this kind suggest at least considerable depth from the front and component parts of the building. The plainer and the more unpretentious the raised portion is, the better. But the desire for display and embellishments seems the stronger when only a thin superficial façade is possible. The designer of shallow fronts appears to delight in pretentious features or eccentricities. He makes the most of his small resources, whereas in the solid building there is more thoroughness and honesty apparent. In fact, shallowness appears to encourage the defects we have referred to. Let us not be misunderstood. No architect can help the awkwardness and impossible conditions of irregular sites; nor can he avoid keeping some portions of his building low when lighting is the first consideration, and unnecessary expense is to be saved; but there is no excuse for him to make his building unsightly by cutting down portions of it in the most reckless manner. Solidity is one of the qualities of good design; we do not mean heaviness or lumpiness, but that regard for thoroughness and honesty which should characterise every building. Our young architects have not the training in composition and modelling which the French and American schools encourage—principles so essential to real artistic work. The elements of massing so important in all monumental architecture are not made a distinctive part of architectural training: we mean the arrangement or grouping of the main parts of a building or its principal rooms, so as to insure a pleasing perspective from certain points of view, in which the scheme of roofing and the intersection of blocks that will produce a pleasing combination or aggregation of parts are included.

EXHIBITION OF WATER-COLOUR DRAWINGS.

AT the Fine Art Society's Rooms, 148, New Bond-street, an interesting selection of water-colour drawings and sketches are now on view. These are by various well-known artists, and represent many Continental, Moorish, and British subjects and landscapes. The drawings or sketches by Frances Hodgkins are remarkable for their truthful impression, richness of colour, and brilliant effects of sunlight, chiefly illustrating Tetuan, the seaport of Morocco, on the north-west coast of Africa. The subjects, "A Moorish Shop," "The Dyers' Courtyard, Tetuan," "Oranges and Onions," "Tangier Market," "Sunshine and Whitewash," are charmingly real, and drawn with much breadth and directness, and show this lady painter's impressions of Moorish life. The delicate tones in Russell Dowson's "Antibes" (11) may be mentioned as a dexterous example of sunlit effect in this French town. Next J. Richard Bagshawe has a sketch from his vigorous pencil of one of those fishing-boat scenes he has made his study. "A Grey Dawn" shows a sea-tossed fishing-boat, with its crew pulling in a net at the side of boat. The artist has clearly been an eye-witness, and his handling of the rough sea and the grey tones of morning are admirable, and realistic of this arduous occupation. John Fulleylove, in his "Valley of Hinnom, with Hill of Offence," gives a faithful transcript of this Eastern scene. J. W. North, in his extremely delicate and dexterous piece of craftsmanship, "The First Day of a Late

Spring" (15), reminds us of a picture of his in this year's Academy. It is a woodland thicket; the brilliant golden and green tints of early foliage are depicted with wonderful grace and minuteness, set off against the distant undergrowth of trees. Hubert Coop's work, of which we see two examples in the room, is clever; but his colour, light, and cloud effects remind one of moonlight. Here, in "Conway, N. Wales," the sun is hidden behind clouds which are tinged with his radiance, and the water and boat and distant scenery are painted in the bluish-grey tones of colour and shadow we are accustomed to see in a moonlight picture. The other view, with boat and fisherwoman and child (62), and soft bluish shadows, is equally suggestive of moonlight. Jessie Douglas, in her Donegal interior, "A Sprigger" (17), is pathetic in its sombre shade. A woman at her work in a dark cottage, the embers of a wood fire burning beside her. John Fulleylove's view of the "Upper Valley of the Kedron" (18) is interesting. Next A. N. Roussoff has a clever drawing of "Court, San Rocco, Venice," with its fine campanile. W. Lee Hankey, in his "Fruit Stall," a group of girls at their stalls, exhibits strength and tenderness of colour. Claude Hayes sends a large hilly landscape, "Near Conway," with sheep in foreground—broad and skilfully handled. C. Macintyre Grierson, in "The Potato Planter," has given us a study of peasant life—a girl planting potatoes on rough ground, strong and realistic. Lexden L. Pocock, in "The Strayed Lamb," is a cleverly-drawn incident; a lamb has slipped down a steep bank, and has been caught in the branches of a small tree overbending a stream, and is being rescued by a young shepherd. "A View from St. Mark's, Venice," by Reginald Barratt (26), and Graham Petrie's "Lion of St. Mark" fully realise the classic ground. Mary Barton has been making Nice and the south of France her hunting ground. "The Cypress Avenue, Villa Arson, Nice" (28), is a noble avenue, and is solidly and feelingly painted. J. L. Gloag is still impressionist in his colouring. There is an intensity of green, and lack of a real perspective in his otherwise interesting study, "The Orchard." Edith A. Tye sends a delightful study called "Silver and Gold," thistle blossoms and seedlings, drawn with tenderness, and charming in colour. G. C. Haite's "Venice from the Public Gardens" is also a masterful drawing, brilliant and rich in colour. The little decorative theme, "The Sea People," by St. George Hare, R.I., is pleasing in drawing and sentiment. Godfrey Merry in his reminiscent scene, "A March of the Irish Guards," has depicted the guards marching to a band from the direction of Hyde Park Corner, which forms a good background. The troops' movement to the time of the drum is skilfully suggested. J. L. Gloag is again seen in his figure subject in the centre of the room, "That Woman's Toy: a Baby." A delicate-looking mother reclining on a couch with an infant, while at foot is a little girl nursing a doll. The theme and sentiment are cleverly treated, and the drawing is good. Below this subject is a decoratively-treated subject, "Winter Gleanings"—two little girls clad in rose-coloured frocks, carrying bundles of wood. They are descending some steps next a cottage or shed, leafless trees forming a background. The girls and the light tones of their dresses are gracefully composed, and the work is by Minnie Smythe, A.R.W.S. Maude Angell, in her flower subject, "Gloire de Dijon" (41), and Bertha Maguire's "Roses" (37) are clever. There is inspiration in Henry M. Rheam's subject, "The Witch"—the figure of a woman standing performing her incantation. Mildred A. Butler, A.R.W.S., in "The Gateway" shows her ability and simple treatment. Frank Walton, R.I., has a pleasing view of

"The Battery, Sark"—a group of rocks in the sea. Frank Saltfleet has a good drawing of Greenwich Pier, showing the Hospital and craft on river. A picturesque old-world street, "Chagford, Devon," by Yeend King, V.P.R.S., is interesting as a sketch of the Devonshire village under a brilliant sun. "The Medici Gardens," by F. A. Rawlence, is a nice sketch, and Saml. J. Hodson's "Palazzo Pubblico, Siena," is a good drawing of the Gothic Palazzo and the Campanile. L. Block gives us one of his inimitable groups of old books, "Such Heaps of Written Thought: Gold of the Dead" (52). A picture gallery is scarcely complete without a work of that brilliant painter of Cornish seas and harbours, John R. Reid, who has "A Cornish Fisherman" (54). The intense green sea is full of quivering light and movement. "San Vitale, Ravenna," is a favourite typical octagon church of the Byzantine period, and A. N. Roussoff's view of the interior is careful in drawing. J. Walter West, in his pretty piece of sentimental *genre*, a young lady with a rose bowl on a marqueterie cabinet, is scholarly and refined. "After-Glow on the Indian Ocean" (58), by Arthur Severn, is a skilfully studied effect. A. W. Weedon, as usual, is charmingly real in his haymaking scenes. Here is one in Sussex (63), a meadow with river winding through it under a summer sky—a good example of his work. There is much beauty of design and rich colour in Alfred East's fine "Golden Autumn," one of the best pictures here. We see the painter at his best, a golden sunset on lofty trees with cottage. The soft blended colour of the foliage suggests a free use of the sponge, which imparts just the sense of glowing vibrating light and colour seen in a strong sun on foliage. The weird desert scene by R. Talbot Kelly, a sandy stretch of the Desert with a solitary camel and rider in the distance, is truthfully depicted. There is excellent character and skilful drawing in Tom Brown's "A Corner of Volendam, Holland." Two old Dutchmen smoking sitting down against a wooden cottage, and one lad standing beside them, yonder is a distant shed and glimpse of sea, clever in composition and colour. Then we have a pleasing study, Kate M. Wyatt's, "A Spring Idyll," Tom Robinson's "In Glen Cloy, Arran," (73), a strong work. Walter Langley, R.I., is represented by "A Cornish Fisherman," an old fisherman of the village, seated, pipe in hand, musing, with a newspaper on his knees; the background thoroughly characteristic of a Cornish coast. The expression on the old man's face, who is pondering over something he has seen in the paper, is true to nature, and the colour is restrained and quiet, if less vigorous in handling than Mr. John R. Reid's work. J. Shaw Crompton's "A Sheep in Wolf's Clothing" is an incident told with much power. The young man who has entered the parlour of a country inn, quite unaware of the presence of an officer in uniform, is intended no doubt to be a deserter. The drawing of "St. John's College, Oxford," by R. Phéne Spiers, is well drawn in the details of the Late flat mul-lioned, corbelled bay windows and gable, with its embattled parapet. There are other interesting sketches which are worth a visit.

HOSPITAL DETAILS.

IN the section on engineering and architecture of the Sanitary Institute Congress, held at Bradford last week, papers were read on a few subjects of interest to the architect—one the "Details of a Hospital Ward," by Mr. A. Saxon Snell, F.R.I.B.A. Mr. Snell spoke of some old principles of ward construction which ought not to be forgotten. There is a tendency to consult new ideas at the cost of neglecting certain important sanitary principles. The author refers to several instances of new wards constructed upon the latest principles which have proved unsuccessful. As he says: "The old wards were known

to be dangerously unclean, and special precautions were therefore taken to counteract their condition. The new wards were so very bright and clean that anything but perfunctory cleaning was scarcely thought necessary. In the old wards (which were dangerously unclean) the windows were kept open, and the very walls, innocent of plaster, were porous enough to be an assistance to ventilation. In their view it appeared that the provision of air inlets was thought to obviate the necessity of opening the windows." Another example of the neglect of well-worn principles is given. "The drainage of a certain building was relaid upon modern principles with manholes at every branch and change of direction. The old drains were always flushed periodically, and thus kept fairly clean. The new drains were supposed to act for ever without such assistance." The author says, five years after they were laid he made an examination of the system, "and was compelled to use a crowbar to open the covers of the manholes, which had never been touched since the drains were first laid." These are instances of the adoption of new methods of inspection which are never properly utilised. In another case the inlet ventilators of a ward were expensively constructed with glazed pipes. On visiting the hospital a year afterwards he found those flues black with dirt. They were never cleaned. Everyone knows it is an accepted principle of ward construction that all angles and corners should be rounded, so as to avoid all sharp angles and deep-cut mouldings where dust and dirt can lodge, and yet this principle is often subverted by the adoption of methods of flooring which harbour disease germs. The insistence of floors of smooth and impervious materials free from holes or crevices is one that cannot be exaggerated. Therefore, the author says plain-jointed soft wood floors are objectionable, as such wood shrinks, and thus leave joints for the secretion of dust and dirt, and are, moreover, absorbent. Speaking of hard wood floors, Mr. Snell has been in the habit of adopting kiln-dried maple in narrow widths, which is an "exceedingly hard and unwearable floor, its light colour showing up dust more readily than dark woods." Oak and teak are commonly used, and the author says that terrazzo floors are advocated on account of their impermeability, though this is questionable, he thinks, when the high polish is worn off the cement. Asphalte is also useful, but its dark colour is against it. As for finishing wooden floors beeswax and turpentine are recommended. The author speaks also of the importance of well rounding the angle between floor and skirting, a radius of 2½ in. to 3 in. being used; but Mr. Snell thinks 1½ in. radius enough, and this hollow or rounding must be formed of the same material as the floor. Sometimes hollow bricks are used for the hollowing, but the joints are numerous. On the question of wall surfaces the author does not discuss the advantages of either the porous or impermeable wall. Hygienically, we should prefer for hospital walls the cavity principle of construction, with materials sufficiently permeable to allow a degree of transpiration; but modern hospital practice has adopted the impervious walls, and the object aimed at is to make the interior wall surfaces as smooth and hard as possible, so as not to retain dust, and to be capable of easy cleaning. The germ theory is accountable for this view as well as for other modern ideas of construction, such as the rounded corners and angles. The hospital ward is often lined with tiles which make an impervious and clean surface; but practically the numerous joints are against it. A more perfect and smooth surface may be insured by a trowelled cement surface painted with enamel paint. Mr. Snell says: "It is scarcely possible to obtain a more generally smooth surface than trowelled cement—Keene's or Sirapite. These can be brought to a polished surface. It is difficult, if not impossible, however, to obtain a really even colour. Although enamel paint can be used with decorative effect, pictures would still be required to decorate the walls, and the ordinary framed picture is a veritable dust-trap. Therein tiled surfaces have the advantage of painted walls, as they can be decorated with permanent pictures painted on the surface. . . . It would be possible to cover permanent wall paintings with glass let in flush with the wall surface, and I am not sure that this has not been done." There is an important suggestion here. We believe that for ordinary wards, painted tile pictures of a quiet character

and tone could be one of the best substitutes; a better would be panels high up or introduced in a deep frieze painted in distemper. We believe pictures can be fixed to the cement surface, and then covered as suggested by glass or enamelled, so as not to harbour dust, and be washable. A bare blank wall surface, even if coloured a nice grey or in quiet tones of green, is monotonous if not relieved by pictures or prints, which appear to be necessary for the eyes of patients of an artistic temperament. The question is one that may well be considered by hygienists and architects engaged in hospital building. Ceilings are suggested to be best painted and non-porous; there are several kinds of paints in the market that may be used; and other appliances, like thin enamelled metal that can be bent easily, have been used. Touching the important question of windows, little definite information is given. The ordinary sash window, with a hopper and spandrel sides to prevent down-draught, is perhaps the simplest mode, and the author thinks that casement windows with solid frames are not open to the objection of angles, crevices, &c., involved in the sash window. At Willesden Parish Infirmary the author has used casement windows brought down to within 12 in. of the floor, and with hopper next the ceiling. The casements open inwards, and form a protection for the bed, and by opening them the wards can be flooded with air. At the Charing-Cross Hospital Mr. Snell is adopting the "Middlesex" windows, which include five sashes of equal size in the height, all of which, excepting the lowest, are hung on centres and controlled by one rod or lever. The sashes close one upon another, and there are no transoms. The lowest sash is hung on the bottom rail. The advantage of this form of window is that it can be opened to a larger extent than the ordinary sash window. All excepting the controlling lever is fixed on the outside of window, and if the glass can be fixed flush with the inner surface of sashes, it is desirable. For doors, hardwood, of course, is adopted, oiled or polished. Enamel paint is also a good substitute. Architects engaged in this class of building are naturally looking for doors without panels, which give a lodgment for dust and dirt. The flush panel doors are a step in the right direction, but the joints open and become crevices for dust. The author then refers to Canadian doors made up of small sections of solid soft wood, very closely fitted together and sheathed with hard wood, dovetailed on the whole, and pressed by hydraulic machinery. A flush-panelled soft-wood door, veneered with thin oak, seems to be all that is desirable, or a thin metal-cased door. In the fittings and furniture of wards the observance of the principles of smoothness, freedom from crevices, and projecting parts is quite as important. The author mentions some improvements in bedside lockers. The tops are now made of glass or marmorite, which is a valuable substitute for glass, and there are no unnecessary joints or crevices, and the whole can be cleaned. As for cupboards, they are certainly objectionable in wards, as they foster concealment of various things. A closed cupboard is used for holding surgical and medical appliances, medicines, &c.; but these should be placed, we certainly agree, not against the wall but in the centre of ward, and the cupboard should be made of hard wood framed and glazed all round, and have glass shelves. Heavy tables and chairs, so charming to the artistic instinct, are shunned by the hospital expert. Stoves are numerous, those made of iron plates and grills and moulded are not recommended; those built up with firebrick and tiles are preferred, as they are cleaner and better radiators. As to the important questions of heating and ventilation, nothing is suggested except that all pipes and fittings should be arranged so as to be easily kept clean; that controlling valves, &c., be kept out of ward; and that all flues, with movable gratings in floors or walls, should be made easy of access for disinfection and cleaning. Mr. Snell refers to the deceptive and objectionable character of many sinks and basins on the market designed for hospitals which are made with glazed surfaces and rounded angles on the top and sides, but are death-traps underneath, full of pockets never likely to be cleaned. In this connection we may refer to some very excellent lavatory basins and fittings for medical and surgical purposes, made by a leading firm of sanitary specialists, we noticed lately, in which all the unseen and underneath parts are scrupulously simple and open for inspection. Fixed lavatories

are now made of materials that are readily cleaned, and with a regard to the sanitary principles we have mentioned. Of course, there is the argument against this extreme view of exacting "openness" of every part of a ward and its fittings. Glass surfaces and partitions, smooth doors and cupboards, the rejection of all angles and mouldings are not conducive to that comfort and artistic sense which patients, as well as healthy persons, are capable of enjoying. Even our scientific principles are likely to be carried to an extreme in these matters of hospital construction and design, and to impair that sense of homeliness and comfort which are essential to health and convalescence.

THE COMPLETION OF TRURO CATHEDRAL.

THE nave and central tower and spire of Truro Cathedral, completing—with the exception of the western towers, the chapterhouse, and cloisters—the late Mr. J. L. Pearson's scheme for the fabric, were opened in the presence of the Prince of Wales on Wednesday. The Diocesan Conference of 1897 decided to lay the foundations of the whole nave and western towers; the first sod was cut by Mr. Nix on May 20, 1898, and the foundations all laid by the end of November in that year. An unknown Cornishman gave £5,000, and other generous contributions brought up the amount to £10,000. In June, 1899, the building operations began. The work proceeded most favourably, the contractors being Messrs. Willcocks, of Wolverhampton, and the clerk of the works Mr. E. Price. The designs of the late Mr. J. L. Pearson, R.A.,* were carried out with absolute fidelity by his son, Mr. Frank L. Pearson. In March, 1901, when a suggestion was made that the memorial to the late Queen Victoria in Cornwall should take the form of the erection of the central tower, Mr. J. Hawke Dennis, formerly of Redruth, now of Grenchurst Park, Surrey, made an offer of £15,000 to finish the tower. An unknown donor has promised stained glass to fill the western windows of the nave, and several of the windows in the aisles of the nave have already been given.

The western portion of Truro Cathedral, now completed, comprises, says Mr. F. L. Pearson, the nave and aisles, with western double porch or narthex, south porch, and western towers. The new work is a completion of the original design, and the same materials have been used as for the eastern portion of the cathedral. The nave is 112 ft. long, 29 ft. wide (the same width as the choir), and 70 ft. high. It is divided into four bays, and these are again sub-divided so that the nave arcades each consist of eight arches. The main piers are circular, with attached shafts and boldly-projecting groin shafts on the nave side; the intermediate piers are elongated, much narrower, and with similar attached shafts. The general lines of the nave follow to some extent those of the choir: they have the same acutely-pointed and richly-moulded arcade arches, bold and very broadly treated triforium, and lofty clerestory with its coupled lancets. The details of the design are, however, much varied, the arches of triforium being filled in with a series of four pointed arches springing from detached shafts and with a large cusped circular opening over them, suggesting incipient rather than developed tracery. The clerestory windows are much wider than those of the choir, but the treatment of the traceried curtain arches is repeated in a varied form. The nave, like the choir, is vaulted in stone, but on a different plan. It is sexpartite, while that of the choir is quadripartite—that is, the vaulted surface in the one case is divided by groin ribs into six, and in the other into four, sections. The broad bays of the nave, 28 ft. wide, intersected by massive transverse ribs, have a very bold and imposing effect as contrasted with the narrower and perhaps more refined treatment of the choir.

The north and south aisles of the nave are 112 ft. long and 14 ft. wide in the clear of the arcade walls, giving a total width of nave and aisles of 62 ft. They are similar in design, and are also vaulted in stone in eight bays, and lighted by a series of lancets, two in each bay, separated by a broad pier, and internally inclosed by a traceried

* The original perspective and ground plan appeared in the *Building News* for May 11, 1883, and reference to these will demonstrate that no material variation has been made in the design since the foundation-stone was laid by the then Prince of Wales, now King Edward VII., three and twenty years ago.

entertain arch after the manner of the nave clerestory, and following in some respects the treatment of the north choir aisle windows. One of the principal entrances to the cathedral is by a south porch, which occupies the westernmost bay of the south aisle; it has but little projection, its dimensions in this direction being circumscribed by the limits of the site. This porch is lofty: it is entered by a bold moulded archway 16ft. high, flanked by square angle pinnacles, and with tiers or niches over it to contain sculpture, some of which is already provided. The doorway is divided by a centre pier, and has elaborate traceried panelwork over it, intended to be enriched with sculpture. An entrance of simpler character occupies a corresponding position on the north side of the cathedral.

The western bay of the cathedral is separated from the nave by a lofty arch, the mouldings of which blend with the nave groining: it is of the width of the nave by 15ft. in depth; it is vaulted in one bay, being, in fact, a continuation of the nave vaulting. Arches north and south rise to a height of 6ft., and give into the western towers; these towers measure 16ft. by 15ft. internally, and are open from floor to vaulting, a height of about 70ft. A western gallery some 20ft. above the floor is erected over the western bay, carried on comparatively low arches, the spandrels of which are enriched with sculpture. This gallery not only provides additional accommodation, but it forms a base to the west end internally, and adds much to its effect. The west end is perhaps one of the most imposing features of the cathedral. Differing from the majority of ancient cathedrals either in this country or abroad, the western doorways are two, not three, or one. They enter directly into the nave through a shallow narthex, vaulted in stone, and not, as is frequently the case, into the aisles through the western towers. These two doorways are of lofty dimensions, and are elaborately treated and recessed under gabled arches, the tympana being filled with sculpture, not, as in so many ancient examples, representing the Doom or kindred subjects, but exhibiting our Lord in his acts of Mercy and Love, and preaching on the Mount and feeding the people in the wilderness.

The west end projects out boldly in front of the two western towers; it is a lofty gable flanked by massive square turrets, the width, including the turrets, being 40ft., and the height to the point of the gable 100ft. The sills of the lowest windows, a pair of coupled lancets, separated by a buttress, 36ft. above the floor, are seen from the inside far above the western gallery. Externally a bold arch springs from the two flanking turrets, rising to a height of 74ft., and inclosing the lancets above described and the rose window over them, which fills almost the entire gable, and consists of seven arched openings clustering round a circular cusped centre, and surrounded by a ring of fourteen quatrefoils, the idea being seven and a multiple of seven. The surface of the gable over its large arc is relieved by diagonal pattern work, interrupted in the spandrels of the arch by panels containing sculpture. A band of nine panels marks the springing of the gable: three of them are pierced for light to the nave roof, the other six contain standing figures of Early Cornish saints already in situ; other panels and a narrow lancet window lead the eye up to the cross on the apex of the gable. The western towers are about 24ft. square, exclusive of the angle buttresses, which have but little projection, but lead up by gentle gradations to the parapets of the tower. A broad western lancet lights the lower stage of each tower; on the second stage are coupled lancets on the two sides which line with the lower lancets of the west gable.

The third stage, not yet erected, will also have coupled windows divided by a centre mullion, and the arches filled with incipient tracery. Above these is the lofty upper stage of the tower, containing very tall windows of two lights with double transoms and interlacing tracery. Being above the nave roof, these windows will be pierced in the four sides of the tower. This stage finishes with a corbel course, enriched cornice, and a pierced parapet; the total height up to this level will be 122ft. The spires will rise to an additional height of 80ft., and have very lofty spire-lights, intersecting the perforated parapet of the tower, and tall hexagonal angle turrets pierced with lancet panelling in two heights. A great feature of the Cathedral externally is the lofty coupled lancets, two in each bay, divided by broad buttresses of but little projection, and its flying buttresses, which mark the divisions of the bays,

springing from massive gabled buttresses which rise high above the aisle walls. The nave roof is a continuation of that of the choir, interrupted only by the central tower, and with a similar covering of slate. The aisle roofs are steep, and are also slated. The floor is paved with marble misciato pavement, and is a continuation of the paving of the crossing.

The central tower is square on plan. Above the roofs it is divided into two unequal stages, all four sides, except for the slight variation in width, being alike. The lower or lantern stage is the smaller of the two, and has three two-light windows deeply recessed in three orders. These windows are visible from the inside of the church and from the lights of the lantern, the vaulted ceiling of which comes immediately above them. The upper or belfry stage also has three two-light windows; but these are of much taller proportions. They are also more deeply recessed, and are filled with oak louvres covered with copper. The heads of these windows are crowned by sharply-pointed gables, which finish under the overhanging corbel course, which comes immediately under the tower parapet. This parapet is richly pierced and traceried, and is divided into three sections corresponding to the windows below by miniature buttresses. The height to the string under the lower parapet is 156ft. The spire rises in simple and unbroken outline from a rich cluster of pinnacles and spire-lights which are grouped round its base. The four angle pinnacles are hexagonal on plan, panelled in two stages, with coupled lancets on each face, and capped with slender spires. They are connected to the central tower by a web of stone, which is gabled and panelled. There is a spire-light in the centre of each of the four cardinal faces of the spire, with tall clustered shafts supporting the traceried head. The total height to the top of the spire is 250ft.

THE SANITARY CONGRESS AT BRADFORD.

THE twenty-first annual congress held under the auspices of the Sanitary Institute took place last week, and was a marked success, both in point of attendance and of the interest manifested in the papers read. The opening address was delivered by the Earl of Stamford, as President, who pointed out that, immense as had been the advancement of scientific knowledge during the past century, we were to-day only standing upon the threshold of those questions which affected the health of the individual; and immense, too, as had been the advance in the social amelioration of the masses, we had only recently entered the field of organised warfare against insanitary conditions. It was a mistake to suppose that mediæval municipalities neglected hygiene; but the imperfection of mediæval sanitary appliances profoundly influenced both religion and economics. He urged that a combination of public and private enterprises should be effected, there being ample room for both methods. But of paramount importance for the cure of the present defects were the education of the country at large, as to its responsibility for the existence of these defects, and the instruction of the working classes themselves as to the necessity of their being provided with healthy homes.

In the conferences that followed Mr. F. E. Fremantle, county medical officer of health for Herts, read a paper on "The Colonisation of Rural England as Foreshadowed by the Garden City Scheme," in which he dealt with Mr. Ebenezer Howard's garden city scheme. Next came a paper on "Cottages for Agricultural Labourers," by Mr. Martin Shaw Briggs, of the Yorkshire Architectural Society. Mr. T. Eustace Hill read a paper on "Suggested Amendments to Part II. of the Housing of the Working Classes Act 1890," and proposed as a resolution the following amendments:—(1) To make the meaning of the word 'owner' the same as in the Public Health Act, 1875; (2) to make the owner of a dwelling-house as to which a closing order has been obtained liable to continuing penalties as long as he permits it to be occupied; (3) to provide that no closing order shall be determined without notice to the council of the administrative county in which the dwelling is situated; (4) to give power to sanitary authorities to make a demolition order as to any building which is dangerous or injurious to the health of its own inhabitants; (5) to give county councils power to enforce the Act in urban districts other than

municipal boroughs; (6) to give an appeal against the dismissal of an application for a closing order." The resolution was carried with an addition—namely, that the council ascertain from other councils what further amendments of the Act were desirable.

In the section devoted to Engineering and Architecture, over which Mr. Maurice Fitz-Maurice, C.M.G., presided, a paper on

A HOSPITAL WARD,

was read by Mr. A. Saxon Snell, F.R.I.B.A., who said that the great principles to be kept in view in the details of a hospital ward are few and simple. Not the least important is the avoidance of all sharp internal angles, deep-out mouldings, and other not easily-cleaned lodgments for dust and dirt. The floor of a ward should be laid on a solid foundation, and the surface should be as impervious as it is possible to make it. Also it should be smooth and free from holes or crevices likely to retain dirt or dust. For this reason no one thinks nowadays of using plain-jointed soft wood floors, because in addition to being absorbent, the material is bound to shrink, and thus leave crevices for the secretion of dirt and dust. Floor sweepings well wetted and impregnated with soap make a horrible compound. Modern floors are of several kinds, which vary according to the fancy of the particular architect or the manager of the building. They comprise the following—viz., hardwood block floors; hardwood tongued boards laid in narrow widths, secret nailed and polished; asphalt; terrazzo; patent composition floors such as Euboelith, &c. The hardwood floors are most frequently made of oak or teak. Hitherto he had himself adopted kiln-dried maple in very narrow widths. In addition to being an exceedingly hard and unwearable floor, its light colour shows up dust much more easily than dark woods. The most useful finishing to wood floors is beeswax and turpentine highly polished. If this is regularly wiped over with a wet rag, and as regularly polished, it is a very good surface; though it is desirable to have the surface entirely cleaned off and renewed at intervals. Terrazzo floors are much advocated on account of their supposed impermeability. Mr. Saxon Snell does not think them quite so impermeable as they are supposed to be. After all, the main part of the material is cement, and it is well known that both cement and marble chips are fairly absorbent materials. Indeed, the comparative impermeability of this floor is due to the high polish it receives when first laid, and that is very soon worn off. These floors are best treated by being polished with beeswax as for wood floors. Even so, they are very hard to the feet, and the mottled colour too easily conceals dirt. Asphalt is, no doubt, the most impervious of floor materials, but it is of a dark, uneven, and bad colour, and is therefore seldom used. The author's experience of patent composition floors has not hitherto been so fortunate as to enable him to commend them highly. They have some undoubted virtues, however, and the material is more impervious, and less subject to the action of acids than any he knows. Unless very carefully laid, they appear to be liable to swell and crack. The material can be coloured, and when polished the surface is excellent. The skirting to the floors should be rounded so as to form a good hollow. The most usual radius is from 2½ in. to 3 in. Latterly Mr. Snell has used 1½ in. only, which is quite sufficient for its purpose, and can be carried round projections more easily than is possible with the larger radius. There are practically two opposite principles which govern the material of which the wall surfaces should be composed, and these are derived from views on that much vexed subject—ventilation. At the present time, for hospital ward walls, at least, impervious walls are mostly in vogue. If we adopt this principle, the next most important consideration is that the surface of the internal faces should be easily cleaned and kept clear and free from dust. The use of tiles gives a more impervious and even surface over a large area, but it is discounted by the numerous joints which no care nor skill in the fixing can make smooth, except in a limited way. The ideal surface would no doubt be an unbroken and polished surface, such as obtains on tiles, affording no ledges for the lodgment of dust; but this has been fairly well achieved by the use of enamel paint upon hard-trowelled cement surfaces. It is scarcely possible to obtain a more generally smooth surface than with trowelled cement—Keene's or Sirapite, for instance. These can be brought to a polished surface. It is difficult, if

not impossible, however, to obtain a really even colour. Ceilings should be non-porous, and are best painted. As to the best form of window for a hospital ward, there appears no general agreement. The most usual is the ordinary sash window, with a hopper above opening into the ward, with spandrel sides to prevent draught. Its form and construction involve, however, the many angles, crevices, and hidden voids which in other parts of the ward we strive so much to avoid. Casement windows with solid frames are at least not open to this objection, though no doubt their advantages in other directions may be questioned. If it is possible to fix the glass of the sashes quite flush with the inner surface of the sashes, a great advance will be made. The doors in a ward should be made wide enough to allow of the passage of a bed, and the upper panels should be glazed with clear glass. For joinery, hardwood throughout is generally adopted, where the question of cost is not vital—hardwood oiled or French-polished. Its comparative freedom from material shrinkage, and its harder or less absorbent surface, are great advantages; but here again enamel paint is not much, if at all, inferior. There are some Canadian doors now made of which the principle of construction could no doubt be applied so as to successfully overcome the difficulty of shrinkage. They are made up of small sections of wood very closely fitted together, and sheathed with hardwood dove-tailed on, and the whole is pressed and almost welded together by hydraulic pressure. At present they are made to imitate the ordinary panelled door, but one is being made for the author now—as an experiment—of solid softwood, sheathed all round in oak. It is in the furniture and fittings of wards, for which the architects are responsible, that there is a general falling away from the principles of construction he was considering, although some very notable improvements have been made in late years in the construction of chairs, tables, and bedside lockers. Cupboards are generally objectionable, and should be as far as possible banished from the ward. One at least is, of course, necessary; but this should not be built against the wall. It should stand out in the centre of the ward, and should be constructed of hardwood, framed and glazed all round and on top, and fitted with glass shelves. Certain ward stoves are excellent for many purposes; but as they are built of iron plates and grills, and plentifully adorned with mouldings, &c., they would appear to be entirely unsuitable to a hospital ward. One or other of the forms of stoves which are built up with plain firebrick and bricks, or tiles, is far preferable. There is a greater amount of heat given out by radiation, and far less by conduction, and there are few lodgments for dust and dirt. Flues of any sort, whether in the floors or walls, should be so constructed, with movable gratings and covers, so as to allow of easy access for cleaning and disinfection. In conclusion, Mr. Saxon Snell urged the necessity for "openness" in every part of a ward and its adjuncts.

PUBLIC BATHS.

Mr. A. Saxon Snell, F.R.I.B.A., also read a paper on the "Influence of Planning and Construction in Baths upon the Cost of Maintenance and Administration." How, and in what direction, he asked, is it possible to economise wisely in respect of the first cost of a building, such as municipal baths? The maintenance and repairs will depend upon soundness of construction and permanence of the surfaces. The working expenses are dependent generally upon good arrangement, but also largely upon the planning of the building. Awkward sites invariably entail straggling and, therefore, uneconomical, plans. The various sections are necessarily so placed that many of them cannot be reached from the entrance except by means of long and wasteful corridors. Every square foot of corridor, &c., may be fairly reckoned as representing 20c.ft. of building, which at a 1s. per foot = 20s. When superfluous space at this price per foot is reckoned by hundreds and thousands of feet, the total is considerable, and worth serious attention as a factor in the cost of such buildings. But that is not the whole cost, for every unnecessary square foot of space involves so much extra expense for maintenance and supervision. As an example of the wastefulness of unsuitable sites, he selected a building planned by himself—the St. Marylebone Baths, where one-third of the space devoted to corridors could have been saved had some adjoining land been purchased, so as to widen the

area. With this he contrasted the plans of his baths at Plaistow and Stratford, where the conditions were less unfavourable. Service corridors are a useless expense. It is preferable to make it impossible for the superintendent to go about the building without passing through one or other of the departments. In the older baths it was no uncommon thing to find four separate entrances for bathers, one for each class of each sex. Nowadays more frequently two entrances only are provided, one for each sex. There is, however, no need for more than one entrance and pay-office, as at a railway station. Waiting-rooms are quite unnecessary adjuncts. Another move in the direction of economy is the abolition of the slipper bath in favour of the spray bath. It occupies just about half the space of the slipper bath, and uses half, or less than half, the water necessary for the former. To this must be added the saving in fuel, &c., in heating the water, and less cost of attendance. A well-appointed and arranged set of spray baths, each with its separate dressing-room, and with common warm and plunge baths, would attract better class bathers in paying numbers. Well-equipped Turkish and Russian baths at a moderate price should also prove paying departments. All the warm baths should be kept as near together as possible and on the same floor level. The boilers and engineering works generally throughout baths should be of the best description, and designed on the most economical lines for the highest efficiency, and by this is meant commercial efficiency, and it is better to reorganise, if necessary, the whole of the engineering plant of an establishment, even at considerable cost, than to waste power and fuel year after year with inferior plant.

THE BACTERIAL TREATMENT OF SEWAGE.

A paper on this subject was read by Professor Henry Robinson, who urged that public money could be usefully expended in experiments directed to determining the best materials and depth for both classes of bacteria beds, the aerobic and the contact classes, also the most effective rates of working. A series of contact beds and of continuous trickling beds worked side by side under similar conditions of flow would give results of the greatest service. If such were carried out, valuable information would be afforded at comparatively small cost for the guidance of those who have to advise as to sewage disposal. The Local Government Board would also have data to assist them in considering the conflicting schemes which now come before them.

HOSPITAL BUILDING AND LIGHTING.

Mr. W. Noble Twelvetrees, of the Institute of Electrical Engineers, showed that even small hospitals could generate electrical energy both for power and light at a less cost than they would have to pay for it to a corporation or company, and that it was cheaper and more wholesome than gas.

CEMENT JOINTS FOR DRAINS AND DRAIN TESTING.

Mr. J. C. D. Armstrong, in a paper on this subject, said the failures of cement joints in stoneware drainpipes are due to one or other of the following causes, viz.:—1. Swelling of the cement in the joint. 2. Uneven expansion of the concrete bed, especially if made of "hot" cement or ground or lias lime, and not of equal thickness, as when deep holes are filled up in the bottom of trench or in large "hand-holes"—the expansion lifts the pipes off their beds. 3. Uneven settlement of the bed—causing deflection of the adjoining joints. 4. Uneven or careless filling-in of the trench, or workmen walking on or knocking the pipes, or by debris falling, &c. 5. Testing or filling-in the trenches before the cement is thoroughly hard. 6. Contraction of the cement in the joints. 7. Failure of the joint to stand the pressure, excepting, of course, the jointing material. Causes 1, 2, and 6 were due entirely to the use of a poor quality of materials or to wrong manipulation, but more failures resulted from cause 4 than any other. The only remedy for causes 4 and 5 was greater carefulness in construction, and notably after inspection. Cause 7 was due either to irregular form of joint or to the sockets and spigots of the pipes being so highly glazed as not to form a proper surface to allow the cement and pipes to thoroughly adhere. The most important part in the joint lies between the end of the spigot and the bottom of the socket. He strongly objected to the use of gaskin joints; the only joint that should be allowed was a rigid cement one.

Mr. C. F. Wike read a paper on

EXPERIMENTS IN SEWAGE TREATMENT AT SHEFFIELD, in which he described tests with open septic tanks and with contact beds. The results indicate that the sewage of Sheffield can be purified satisfactorily by the simple settlement of the sewage in tanks, and by subsequent treatment in double contact beds. In the case of settled sewage greater purification has been obtained than by the open septic tank process, although both systems have given effluents which are non-putrescible, and conform to any reasonable standard of purity for sewage effluents. The great advantage which it was anticipated would result from the action of the open septic tank in facilitating further purification has not been realised, nor apparently does the system present a solution of the sludge difficulty. As the proportion of sludge destroyed is only about 30 per cent., and probably less, it is a question for serious consideration whether the large tank area required, the liability to nuisance, and the difficulty in dealing with sludge in bulk, are compensated for by the destruction of so small an amount of sludge.

THE INTERNATIONAL FIRE PREVENTION CONGRESS.

THE concluding meetings of the International Fire Prevention Congress, convened by the British Fire Prevention Committee, and reported in our last issue pp. 37-8, were held on Thursday in last week at Caxton Hall, Westminster. The day's proceedings began with the sectional meetings, which were followed by a general meeting, over which Mr. Edwin O. Sachs (chairman of the British Fire Prevention Committee) presided.

ELECTRICAL SAFEGUARDS.

In the section dealing with "Electrical Safeguards and Fire Alarms," papers were contributed by Mr. E. C. de Segundo on "Electric Wiring and Fire Risks," and by Mr. Alfred Hands on "Necessary Practical Safeguards against Lightning."

Mr. E. C. de Segundo said in the course of his paper that the essential condition of a properly-erected wiring installation consisted in providing that the electric current should be kept within its prescribed bounds, and that if by any unforeseen contingency a way should be opened for the current to travel in an unauthorised direction the supply should be cut off automatically and instantly. No absolutely trustworthy means has as yet been devised whereby possible trouble due to electricity "out of bounds" could be guarded against, and the efforts of those who were working in the cause of fire prevention should be directed towards bringing about the adoption of the best kind of insulation and the most suitable kind of mechanical protection for the wires. For safety against risk of fire one must, he remarked, depend entirely upon the means adopted for keeping the electric current within its designed sphere of action—namely, the character of the insulation of the wires or the means adopted to prevent contact between wires of opposite polarity. This included the insulation on the wire and the means adopted to guard against mechanical injury and damp. Up to the present nothing had been found to touch best quality rubber specially prepared to resist the oxidising action of the atmosphere, and the deleterious influence of any rise in temperature of the conductor. It was possible, however, that before long a new form of insulator might be introduced upon the English market which, while possessing all the useful properties of guttapercha, was practically indifferent to the action of light and air, and was very much harder than guttapercha. Large quantities of wires insulated with this material had already been used on the Continent with excellent results. The ideal method of wiring a building, in his opinion, was to use nothing but the highest class of vulcanised or other suitable rubber insulation with some suitable form of mechanical protection in the way of briding, and to inclose the wires in a continuous system of cold-drawn steel tubes specially selected for smoothness of bore, with joint boxes inserted at all points necessary to enable the drawing in of the wires to be carried out without injury to their protective covering, and to facilitate inspection, withdrawal of any wires for the purpose, if need be, of increasing their size, &c., the whole system of steel tube and joint boxes being connected to earth.

Mr. Hands stated in his paper on "Necessary

Practical Safeguards against Fires caused by Lightning—thunderstorms were gradually increasing over the whole of civilised Europe, and in the course of 60 years the average number of such storms in London had increased from 12 to 22 per annum. Considering the number of lightning discharges in these storms, it appeared evident that damage would be very much more frequent if it were not for the lightning conductors in use. Conductors, however, were not always successful. There was a tendency to regard protection from lightning too much as being the mere putting up of lightning conductors. True protection from lightning often consisted of a good deal more than the mere erection of conductors. The part that often made the difference between efficiency and non-efficiency was the making of various connections to bridge over sparking gaps, as well as keeping a safe distance away from metals that it would be dangerous to connect to. For general purposes the system to be adopted was an intelligent consideration of the conditions that might exist in the structure to be protected.

The principal resolutions which were passed by the Congress at its final meeting were as follows:—That the term "fire-resisting" be adopted in place of "fireproof," as being the more applicable for general use; that the standards of fire-resistance shall be (1) the temporary protective class, (2) the partially protective class; and (3) the fully protective class; that testing stations for fire-resisting materials be established, and a universal method of testing be adopted; that courses of study be provided in universities, technical colleges, and schools for the instruction of engineering and architectural students in the fire-resistance of building materials and the methods of construction as based on investigation; and that in all cases of fire an official inquiry shall follow.

PRACTICAL SCIENCE FOR PLUMBERS, ENGINEERS, AND STUDENTS.

A SERIES of Short Chapters on Physics, Metals, Hydraulics, Heat, and Temperature, as applied to Problems of Practical Work, has been published by Mr. B. T. Batford, from the pen of Mr. J. Wright Clarke, Lecturer on Plumbing at the Polytechnic, Regent-street, and the volume has the advantage of being illustrated by diagrams. This is the kind of handbook which serves to amplify the classwork of a technical school, and, in the face of foreign competition, it is essential that the plumber in particular, and the workman generally, should be induced to become acquainted with the sciences associated with their craft. The students who attend scientific classes of this kind are limited, and teaching of this nature, in any case, ought to be supplemented by reading, particularly when the attendances are intermittent, and the course of lectures are broken into from one cause or another. The work before us appears to be eminently adapted to its purpose. The cases are clearly stated, and the problems are graphically described and explained, though in some cases the details of the diagrams might have been larger perhaps with advantage. The price of the book is five shillings net.

Alterations and additions are about to be made to the Royal Air Hospital in Dean-street, Soho, from plans by Mr. A. O. Collard.

Herr Bernhard Hertel has been appointed by the Prussian Government architect to the Cologne Cathedral. He is a well-known authority on Gothic architecture.

Lord Rosebery opened, on Wednesday, three pavilions in extensions of the Victoria Hospital for the open-air treatment of consumption, at Craigleith, near Edinburgh.

Princess Louise, Duchess of Argyll, unveiled, on Friday, a bust of the late Sir Arthur Sullivan which, with the permission of the London County Council, has been placed in the Thames Embankment Gardens, immediately in front of the Savoy Theatre, and a little east of the Robert Rukes statue. The bust, which is the work of Mr. W. Goscombe John, A.R.A., is erected on a stone pillar, against the front of which a bronze figure representing "Grief" is resting, and on one side of a stone slab which supports the memorial are several instruments, the mask of comedy, and a book of music, all worked in bronze. The name of the composer and the dates 1842 and 1900 are carved in a piece of stone attached to the base of the memorial, while on one side of the column on which the bust stands are lines by Mr. W. S. Gilbert.

OBITUARY.

Mr. THOMAS D. EVANS, one of the best-known architects in Western Pennsylvania, died at the hospital in Pittsburgh a fortnight ago from a paralytic shock. Mr. Evans was a Welshman by birth, but had lived in the United States since his childhood. He served in a Pennsylvania cavalry regiment throughout the Civil War, suffering a severe wound, for which he was treated in the same hospital in which he died forty years later. After the war, he studied architecture with the firm of Barr and Moser; and, in 1871, began practice on his own account. He designed many of the principal buildings in and about Pittsburgh, and was, at the same time, highly esteemed by his professional associates. He was for some time President of the Pittsburgh Chapter of the American Institute of Architects.

CHIPS.

The parish church of Greatham has been reopened by the Bishop of Lincoln, after being restored at a cost of about £1,500. The work has been carried out by Messrs. Bowman and Sons, of Stamford, the architect being Mr. C. Hodgson Fowler, of Durham. A carved pulpit has been presented by a parishioner.

The new premises of the Royal Dockyard Orphanage in Milehouse-road, Plymouth, were formally opened on Saturday. The new building was designed by Mr. H. J. Snell, and was erected by Mr. S. Roberts. Hitherto the accommodation in the home has been for 22 children; the new premises will provide for 56. On the ground floor there are dining-rooms, a board-room, and reception-room, together with kitchen, scullery, &c. The first floor is devoted to dormitories for girls, together with bathrooms, wardrobe-rooms, and lavatories, and the second floor is reserved for the boys. There are also rooms for the master and matron, and an isolation room.

A new hospital for European women is about to be built at Bombay from plans by Mr. John Begg, consulting architect to the Government. It will accommodate 60 patients.

The Tanat Valley Light Railway in Salop and Montgomeryshire is approaching completion, all the bridges, culverts, and waterways being finished. It will be opened in September. Mr. Collin is the engineer, and Mr. Strachan the contractor. The line runs from Oswestry to Porthwyman and Llangynog, and has cost about £60,000.

The designs for the dedicatory plates in connection with the 7th Dragoon Guards South African Memorial in Norwich Cathedral have now been approved by the officers of the regiment in South Africa. They will be executed by Mr. Harold East, of the Upper Market, Norwich. The memorial itself will be a stained-glass window, the work of a London firm, and this will fill the second opening on the east side of the north transept. Beneath this will be placed the two dedicatory brasses.

Memorial stones of a new Wesleyan chapel at Brenty were laid last week. The structure is of red brick with Bath-stone dressings. It will accommodate about a hundred people. The architect is Mr. John Young, and the builder is Mr. W. Harris, of Westbury-on-Trym.

Two new schools are being built for Erdington, by the Aston School Board, one, of a higher grade character, to be erected in Fentham-road, Erdington, and the other in Slade-road. Building operations have already commenced. The school in Slade-road, which will be the larger of the two buildings, will cost over £9,000, and will consist of two blocks. Accommodation will be provided for about 650 children. There will be provision for cookery classes. The architect is Mr. Jenkins, of Bennett's Hill. At Fentham-road at present an infants' block only will be constructed, affording accommodation for 400 children in seven classrooms. When completed the building will be used as a higher grade school for 300 boys and 300 girls. This school will be erected to the designs of Messrs. Cossins, Peacock, and Bewlay, Colmore-row. The contract of the builders for the present building amounts to £5,997.

The Hexham Rural District Council have adopted a scheme of water supply for Haydon Bridge prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, and estimated to cost £5,000.

The partnership hitherto subsisting between E. A. Swane and H. W. Ayles, architects and surveyors, Newport and Freshwater, Isle of Wight, under the style of Swane and Ayles, has been dissolved; as has also that between E. Stiff, S. J. Stiff, J. A. Stiff, and W. F. Stiff, stonemasons and terracotta manufacturers, London Pottery, Lambeth, S.E., under the style of James Stiff and Sons, so far as regards E. Stiff.

PROFESSIONAL AND TRADE SOCIETIES.

INSTITUTE OF SANITARY ENGINEERS.—The provincial summer meeting of the members of the Institute of Sanitary Engineers was held on Tuesday in the town-hall, Wolverhampton, when a cordial welcome was extended to them by the mayor of the borough, Alderman Thorne, the chairman of the Corporation Health Committee. The president, Mr. W. J. Dibdin, delivered an address on "The Theory and Practice of Filtration." A discussion followed. After luncheon the members proceeded to inspect Messrs. Hamblet's Blue Brick Works at West Bromwich. The meetings were continued on Wednesday and Thursday.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.—The secretary of the National Federation of Building Trade Employers of Great Britain and Ireland has issued the programme for the half-yearly meetings to be held at Cardiff on Tuesday, Wednesday, and Thursday in next week. On Tuesday the visitors will receive an official welcome from the Mayor of Cardiff at the South Wales Institute of Engineers, and a meeting of the council will follow at the same place, after which there will be a luncheon at the Royal Hotel, by invitation of the Cardiff Master Builders' Association. A visit will be paid in the afternoon to the new Law Courts, where members will be received by the Mayor (Alderman Thomas), the chairman of the building committee (Alderman Carey), the architects (Messrs. Lanchester, Stewart, and Richards), and the contractors (Messrs. E. Turner and Sons). A banquet at the Royal Hotel will conclude the first day's programme. The general meeting is fixed for Wednesday morning. The afternoon will be devoted to visits to the docks and the new dock works, and to Messrs. Guest, Keen, and Nettlefold's works, and in the evening there will be a reception in the town hall by the Mayor and Mayoress of Cardiff. On Thursday there is to be an excursion to Ilfracombe per steamer *Cambria*.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The annual congress of this institute was opened on Wednesday night in St. George's Hall, Liverpool. Professor W. R. Smith, president of the institute, asked the Earl of Derby to accept the honorary Fellowship of the institute, and invested him with the badge of office as president of the congress. Harben medals of 1901 and 1902 were presented to Sir Charles Cameron and Professor W. R. Smith. Lord Derby afterwards delivered his presidential address, in which he dealt with the progress made in sanitation and the precautions that were now taken for protecting the public health.

WILTSHIRE ARCHEOLOGICAL SOCIETY.—This society opened its jubilee meeting on Wednesday in Devizes, the town where it originated in a meeting held under the presidency of the then Lord Lansdowne on October 12, 1853. The Marquis of Bath this year begins a presidential term (three years), but owing to a family bereavement he was unable to attend, and the business meeting on Wednesday was presided over by Mr. N. H. Story-Maskelyne. The report recorded a membership of 365, and announced the resignation of Mr. H. G. Medlicott as general secretary, a post he has held for many years. Mr. E. O. Pleydell-Bouverie was elected in Mr. Medlicott's place. A detailed description was given of a Roman villa excavated at Box, a village near Bath, which has been undertaken since the last meeting of the society at the sole cost of a member—Mr. W. Heward Bell. The existence of the villa has been known for many years, and fragments of it were unearthed in 1831, but only now have the investigations been anything like exhaustive, and even so they are not complete. The size of the ground plan of the villa has been approximately fixed at 174ft. from east to west and 216ft. from north to south. Some of the hypocausts, pavements, and walls are in good condition.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied a number of their patent Manchester grates to the New Naval Barracks, Portsmouth.

At St. Mary's Hall, Coventry, on Friday, Colonel W. Langton Coke, on behalf of the Local Government Board, held an inquiry into the application of the Coventry Corporation for sanction to borrow £1,000 for works of drainage on their Baginton sewage farm, and £2,619 for the redemption of the tithe rent charge on such farm.

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ILLUSTRATIONS.

ROYAL HOSPITAL FOR CHILDREN AND WOMEN, WATERLOO-ROAD, S.E.—BLUE COAT SCHOOL, LIVERPOOL.—LIVERPOOL CATHEDRAL: DESIGN BY C. A. NICHOLSON.—"COLDHARBOUR," SURREY.—NEW LODGE AT FORTY HILL, ENFIELD.—PROPOSED PUBLIC LIBRARY, FENTON.—THE GATEHOUSE, STANWAY HALL, GLO.—A MODERN GERMAN SITTING ROOM.

Our Illustrations.

THE ROYAL HOSPITAL FOR CHILDREN AND WOMEN, WATERLOO ROAD, S.E.

This Hospital is situated at the corner of Waterloo-road and Stamford-street, almost opposite Waterloo Station. It is being rebuilt as a memorial to the late Queen Victoria (who was a patron and governor) in two sections. The first portion in Waterloo-road, now in course of construction, will provide for about 100 beds, and an extensive outpatients' department. The front will be faced with red brick and Doulton's buff terracotta. The contract for the section now in progress is £30,000. Messrs. Holliday and Greenwood are the contractors. The architects are Messrs. Waring and Nicholson, of Parliament-street, Westminster.

BLUE COAT HOSPITAL, LIVERPOOL: MEMORIAL CHAPEL.

This drawing hangs now at the Royal Academy Exhibition with the exterior view which we illustrated on June 26 last, when we published a description of the new buildings, of which Messrs. Briggs and Wolstenholme are joint architects with Messrs. Hobbs and Thornely, of Liverpool. We gave a plan with our previous plate of this chapel.

LIVERPOOL CATHEDRAL.

THE "West front" facing Upper Duke-street, which we print to-day is one of the best features in Mr. Nicholson's design, of which we illustrated the main side elevation and plan on June 5. We gave his longitudinal section on June 26. The plate now published shows the detail of the principal portal to a large size not before published.

"COLDHARBOUR," SURREY.

The drawing of this house is self-explanatory, and the small plan reproduced gives the arrangement of the rooms. The site is a hillside one, sloping down from the road, and the garden will be arranged in terraces. On the first floor are four bedrooms, two dressing-rooms, bath-room, lavatory, and linen-room, and the attic floor provides three bedrooms, servants' dormitory, box-room, and cistern-room. The materials are roughcast with stone dressings, and the roof covered with hand-made tiles. Mr. W. E. Brooks, A.R.I.B.A., is the architect.

FORTY HILL LODGE.

This Lodge is to replace an old building situate near the entrance gates to Forty Hill, Enfield. The rooms are arranged with a south aspect, the living-room overlooking the entrance-gates to drive. Externally the walls are to be finished roughcast. The timber-work is to be carried out in oak, and the roof covered with hand-made tiles. Mr. Sydney W. Cranfield is the architect,

and the drawing was exhibited at the Royal Academy with others which we illustrated on May 8 last.

FENTON LIBRARY: FIRST PREMIATED DESIGN.

This library design was chosen in the late competition with eighty-nine competitors, and awarded the first premium by Mr. Ernest George, the assessor. It is proposed to be built of red bricks, and the roof of green Westmoreland slates in diminishing courses from eaves to ridge, with cast lead ridges and hips, and white painted woodwork. Messrs. Charles F. Short and Arthur J. Penty are the joint architects. The building, when built, will be a "Carnegie Library." We shall illustrate the second premiated design shortly.

THE GATEHOUSE, STANWAY HALL, GLOUCESTERSHIRE.

We publish a sheet of measured details of the street front of the Gatehouse at Stanway Park, Gloucestershire. In our issue of August 9, 1895, we published a double-page drawing, by Mr. Maurice B. Adams, of the courtyard elevation of this building, and sketches of the doorway from courtyard to churchyard, together with a small-scale ground plan of courtyard, and accompanying these illustrations an historical sketch of the buildings and house generally, in connection with the A.A. visit on the annual excursion that year. The street front we did not illustrate, and, so far as we are aware, no measured drawing has yet been published of this front. Our present illustration is drawn by Mr. T. Overbury, of Cheltenham.

A MODERN GERMAN SITTING ROOM.

This group of furniture is notable chiefly for its novelty, and in its execution there is nothing to be desired. As to whether it represents a type of design suitable for execution in wood remains a matter, no doubt, upon which tastes will differ. Anyway, it has the merit of all being in keeping one piece with the other, and, besides, it represents a style very much the fashion among the arts and crafts community in Germany just now. The author of these designs is Professor Jan. Kotěra, of Prague, who has founded quite a school of workers who follow his lead.

The Countess of Carrington laid the memorial-stone of the Passmore Edwards Polytechnic at Camberwell yesterday. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

The Bradford City Council settled on Tuesday the vexed question of the much-needed extension of the town-hall by adopting a scheme which provides that there shall be no external alteration to the existing building, but that the thoroughfare in the rear of it shall be closed, and that the space occupied by the old building adjacent shall be utilised for the extension. The plans will provide for the addition of another story to the existing building, should that be considered at any time necessary. The estimated cost of the scheme is £65,000.

Mr. E. A. Sandford Fawcett, A.M.I.C.E., a Local Government Board inspector, has held an inquiry at the Market Hall, Midsomer Norton, into an application of the Midsomer Norton Council for permission to borrow £1,200 for works of water supply to be constructed in the parish of Chilcompton, and also for borrowing £1,850 for purchasing the Market Hall, Midsomer Norton, and for adapting the same for the purposes of public offices.

Princess Henry of Battenberg on Wednesday laid the memorial-stone of a soldiers' and sailors' institute which is being erected at Devouport. The building is to comprise recreation-rooms, coffee hall, and bar, with sleeping accommodation arranged partly as cubicles on the Rowton-house principle and partly as dormitories. There is also accommodation for the families of married soldiers and sailors, including sitting and bed rooms. The design of the building is of a Queen Anne character. The architect is Mr. C. R. Kitsur, and the builder Mr. W. E. Blake.

The East Riding Antiquarian Society visited on Monday Wetwang and Fridaythorpe, and inspected the churches at those places, which have recently been restored by Sir Tatton Sykes, and the British intrenchments between Fridaythorpe and Fimber, the Rev. E. Maule Cole, vicar of Wetwang, acting as guide and describing the places visited.

The death took place at South Hylton, on Monday, of Mr. Matthew Gibbons, timber merchant. The deceased gentleman was chairman of the Hylton Parish Council, and formerly chairman of the Hylton School Board. Mr. Gibbons was in his fifty-fifth year, and leaves a widow, four daughters, and a son.

COMPETITIONS.

BLACKPOOL.—In announcing the award for the Blackpool Technical School Competition, p. 43 last week, we published the names of the successful architects as Potts, Son, and Pickup, as given in the local newspapers. The name of the firm for some years now has been Potts, Son, and Hennings, of Manchester, Bolton, and London.

COLWYN BAY.—In a competition for the best set of designs for a block of first-class business premises at the corner of Penrhyn and Conway-roads, Colwyn Bay, the first premium has been awarded to Mr. E. A. Lloyd, Blackburn, and the second to Mr. D. M. Roberts, Colwyn Bay.

HAMILTON, N.B.—At a meeting of the parish council it was reported that, of eighteen plans sent in for the laying-out of the new cemetery, Mr. Alex. Cullen, architect, had adjudicated as follows:—(1) "Confide," John B. Brodie, C.E., 136, Wellington-street, Glasgow; (2) "Eventide," John Cowan, C.E., 179, West Regent-street, Glasgow; (3) "Experience," A. and R. McCulloch, C.E., 25, Gayfield-square, Edinburgh.

LEITH.—The parish council at their meeting on Monday considered the recommendation of the building committee that plan 6 of the proposed new poorhouse, No. 2 scheme (brick), subject to such modification as might be determined, be adopted. Approval of the minute having been moved, Mr. Johnson submitted an amendment that before deciding on any plan, an expert be asked to advise the council. No two architects were offering the same thing, and therefore he thought it would be foolish on the part of the council to decide without taking expert evidence. The architect's estimate of the building in stone according to one plan was £94,939, and the measurer's £92,939. Plan No. 6 was estimated by the architect to cost £14,000, the measurer said £68,784. On a division the recommendation was approved by eleven votes to six after considerable discussion. The name of the author of the selected design did not transpire.

SUNDERLAND.—At the last meeting of the town council it was agreed, on the recommendation of the Town Hall Committee, that Mr. John Eltringham, of Sunderland, author of the first premiated design for the proposed additions and alterations to the Victoria Hall, should be appointed architect for same.

The Education Committee of Southampton has been recommended by one of the sub-committees to appoint Mr. Crowther, the borough engineer, as architect and surveyor to the local education authority.

At Milderton church a new memorial chancel screen, erected by Messrs. Harry Hems and Sons, of Exeter, was dedicated on Thursday in last week. It is Perpendicular in style, and was constructed in English oak.

The building boom which has been in existence in Partick during the past year still continues, and at the local Dean of Guild Court on Friday plans of buildings, valued at close upon £10,000 were passed.

Considerable opposition is being raised by the Historical Records Committee of the London County Council, by the City Corporation, and others interested in preserving ancient landmarks in London, to the proposal of the borough council of Southwark to demolish the well-known obelisk of Portland stone in St. George's-circus, erected in 1771, as a memorial to Alderman Brass Crosby, the man who contended for and secured a free Press, by obtaining the release of a printer imprisoned for publishing the Parliamentary debates, and to substitute for it a clock tower of meagre proportions, offered by a firm of wholesale tobaccoists.

A bronze-coloured facsimile of Stevens's plaster model of the equestrian figure for the Wellington monument, with certain missing parts supplied by Mr. John Tweed, from Stevens's sketch model, has now been placed in position in St. Paul's Cathedral, and will be open to public view, by permission of the Dean and Chapter, until Monday evening next. The appearance of the equestrian group, as seen from south-east or south-west, from the space under the dome, or from the nave, is very effective, and obviously completes the outline of the monument. The pedestal on which the horse stands projects, however, a trifle too far, and might well be slightly reduced in area.

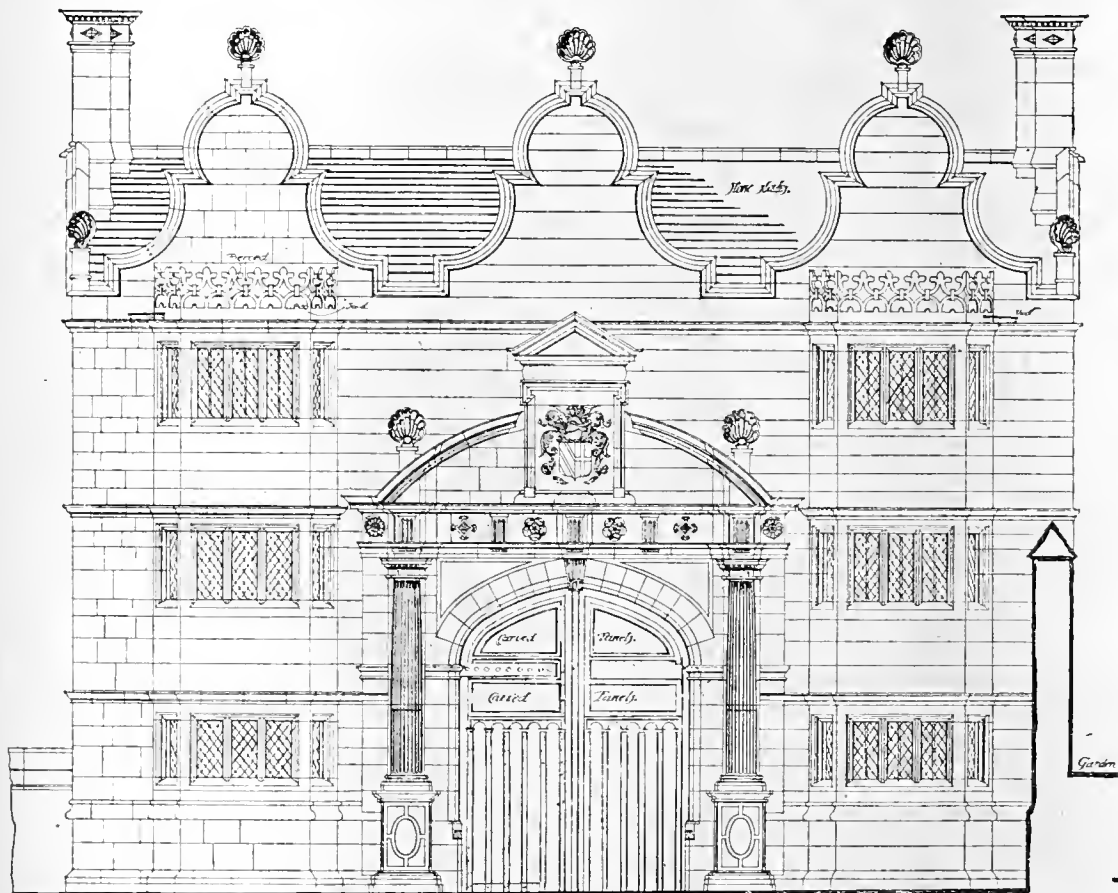
The British Archaeological Association during their forthcoming visit to Sheffield will visit Beauchief Hall, Dronfield and Chesterfield, Work-sop Priory Church, Ecclefield Priory House, Rotherham Church and Bridge Chapel, with Roche Abbey, and Carbrook Hall and Winobank Hill.

The Calthouse, Stanway Hall, Glou.

Detail of Elevation towards Road.

Note. The whole of front is executed in stone with an ashlar face, & is largely covered with vegetable matter so that the jointing is very indistinct.

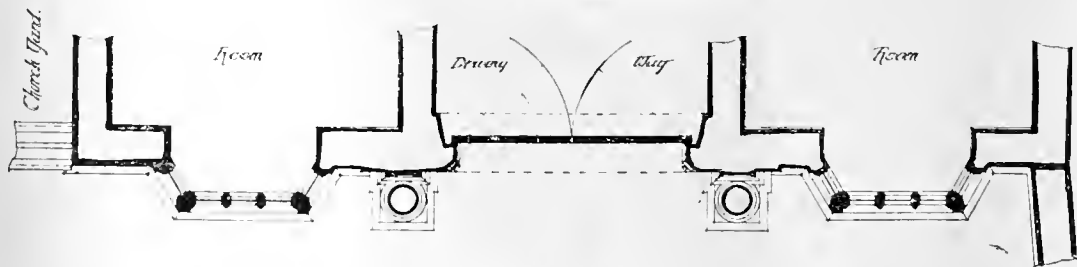
The panels of doors are richly carved with strapwork ornament etc. & the framing of door is shrouded with large nail heads.



Elevation towards Road.

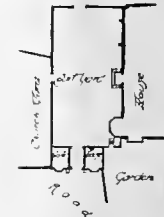


Section thro' Archway.



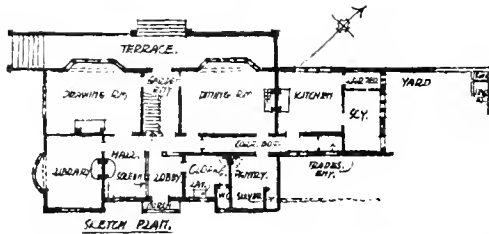
Part Ground Plan.

Scale of feet



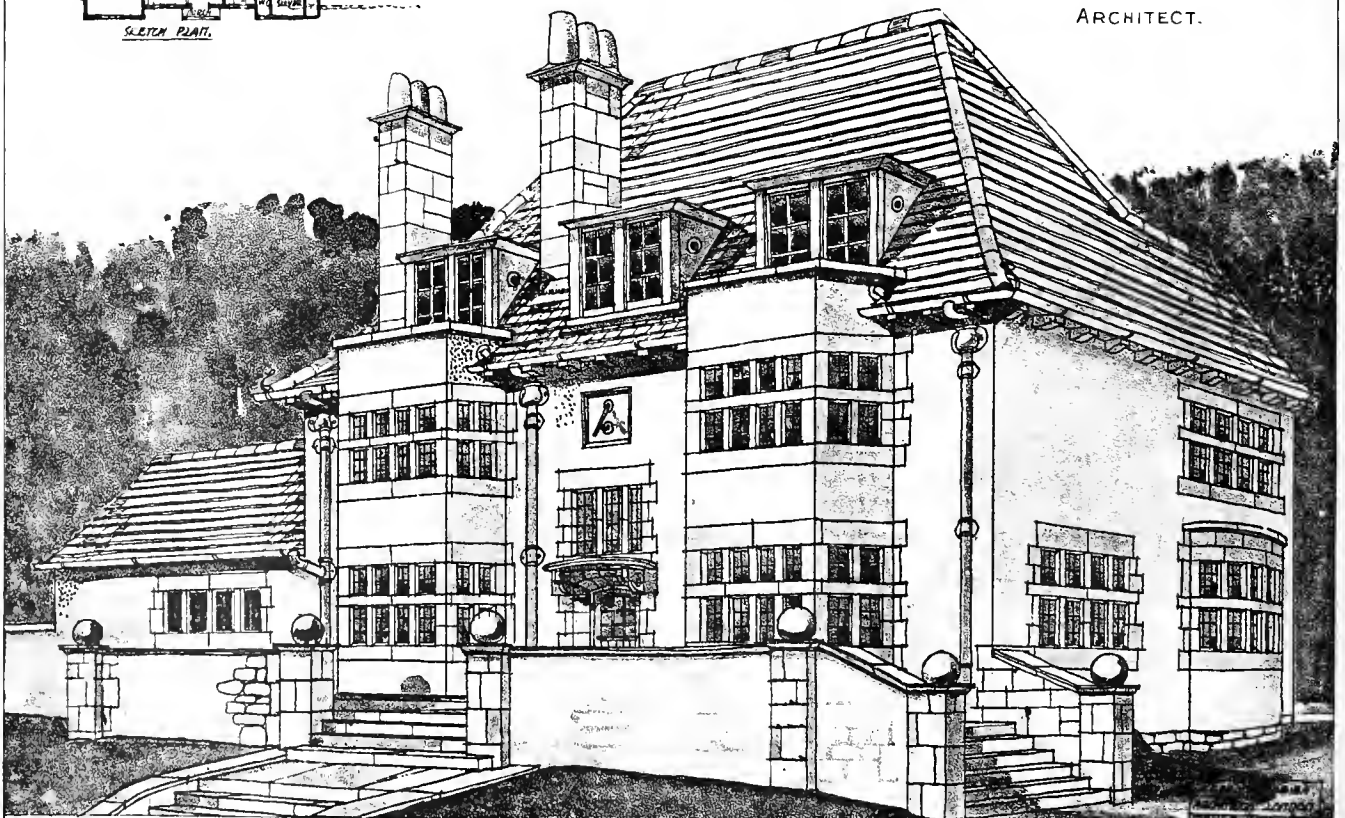
Archway Plan

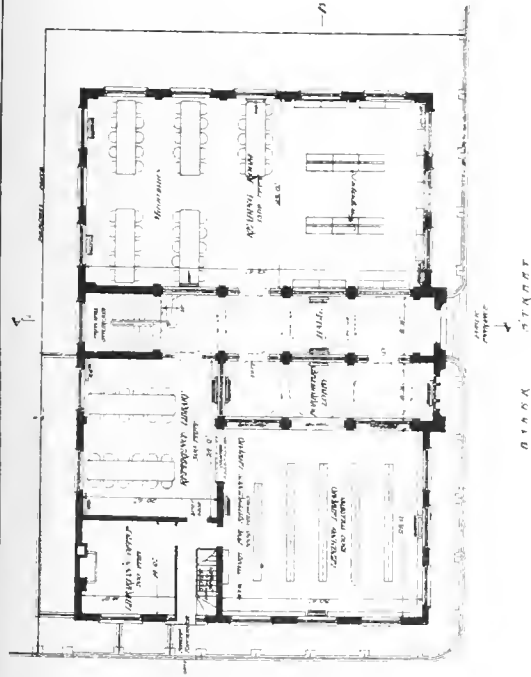
*Designed & drawn
by T. Durberry.*



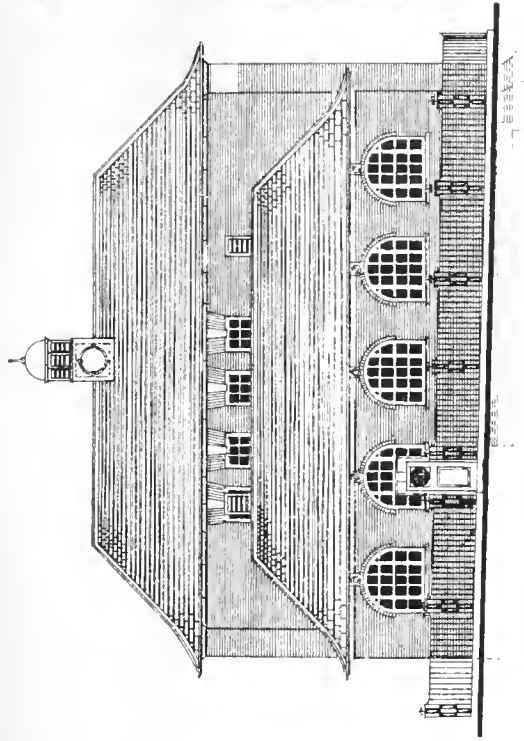
COLDHARBOUR, SURREY
FOR F. A. CORBETT ESQUIRE.
THE GARDEN FRONT

W. E. BROOKS, A.R.I.B.A.
ARCHITECT.

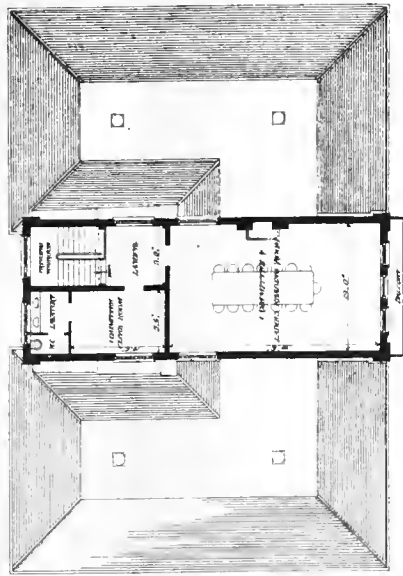




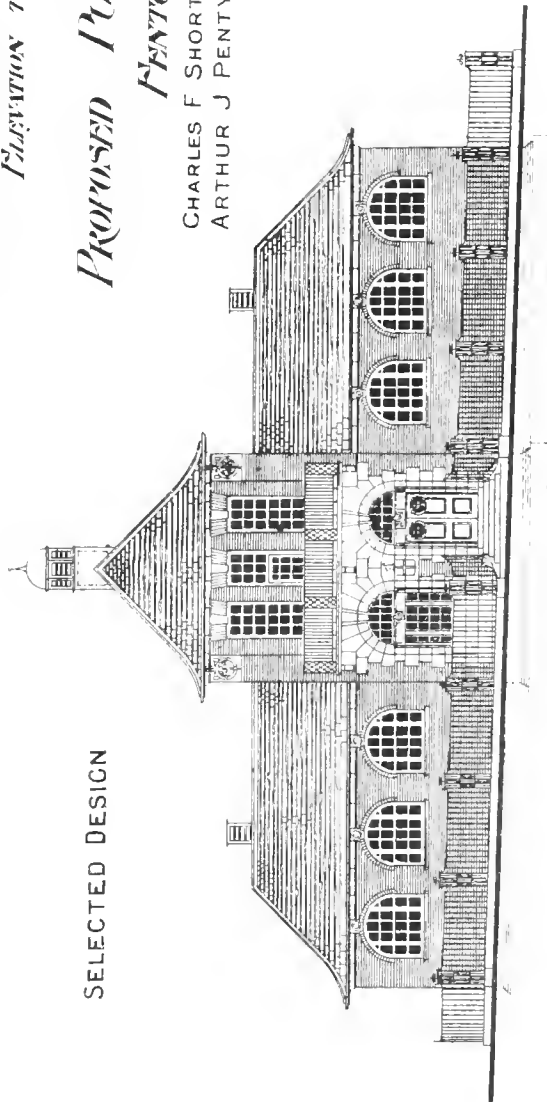
GROUND FLOOR PLAN.



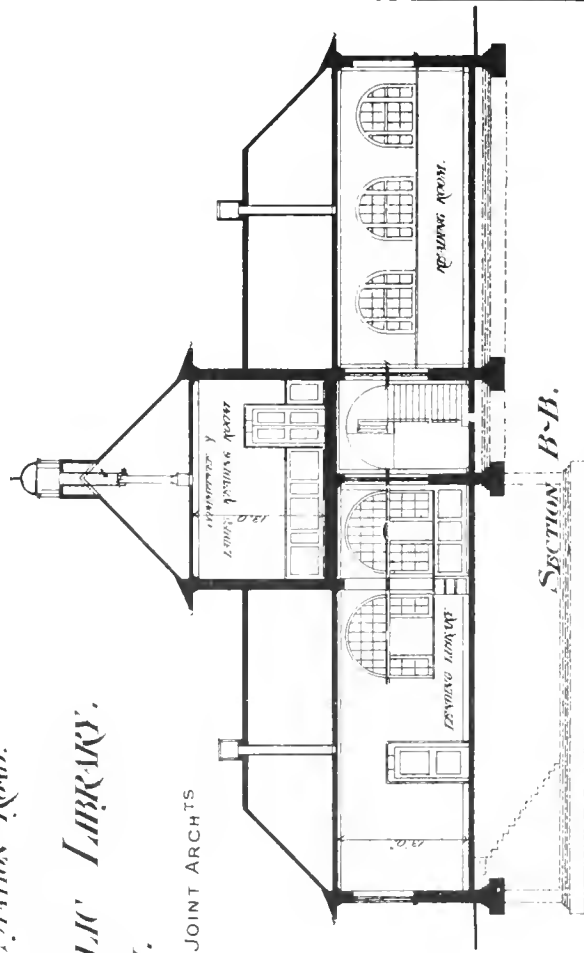
ELEVATION TO STATION ROAD.



FIRST FLOOR PLAN.



ELEVATION TO PARK STREET.



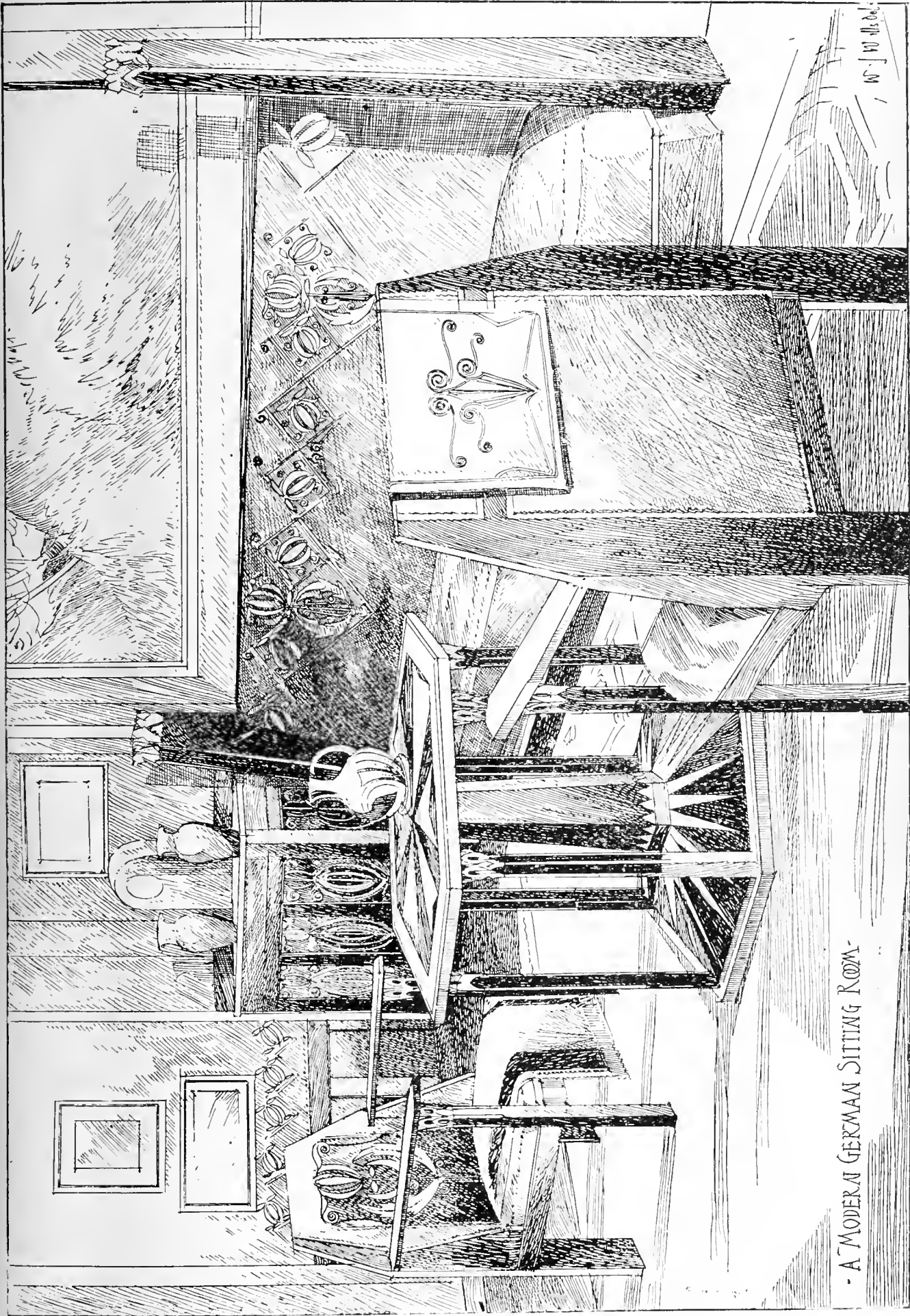
SECTION B-B.

SELECTED DESIGN

PROPOSED PUBLIC LIBRARY.
FENTON.

CHARLES F SHORT } JOINT ARCHTS
ARTHUR J PENTY }





- A MODERN GERMAN SITTING ROOM -

Engineering Notes.

YALDING.—The new stone bridge, built by the Kent County Council over the Medway in Hampstead-lane, near to the railway station, was opened on Wednesday week. The new bridge replaces an old and inadequate wooden structure, much inferior to the temporary bridge in service during the course of construction. It is of Kentish ragstone, with railed approaches of iron tubing, and a parapet wall of ragstone. The approaches extend some 200ft. on either side, and have a gradient of 1 in 20. The bridge itself is of steel girders, with Hobson's patent flooring, both girders and flooring having been supplied and fixed by the Cleveland Bridge and Engineering Company, of Darlington. There is a clear roadway of 16ft. 6in. and a 4ft. path. The bridge crosses the river almost at an angle of 45°, and allows barges 9ft. 6in. head room, and a waterway of 21ft. In addition, there are five land arches, 10ft. in breadth, for the accommodation, in flood time, of the extra water. The bridge has been erected by Messrs. Wallis and Sons, of Maidstone to plans and specifications prepared by Mr. F. W. Ruck, the county surveyor, and the contract price was £4,150, the total cost being £4,400.

Building Intelligence.

BUILT WELL.—Alpha Presbyterian Church has just been completed at a cost of £1,500. The new building occupies the site of the old chapel and adjoining cottages, as well as land at the side and in front. The style is Perpendicular Gothic, and the walls have been built of local blue stone with freestone dressings. The side elevation, facing the picturesque river Wye, is broken up with gables and a square-pinnacled tower which, rising to a height of 70ft., is surmounted by a flagstaff. The main entrance is in the west elevation, above which is a window with tracery work, surmounted by a gable. To suit the contour of the adjoining road the western end of the structure has been shaped octagonally, the sides being terminated with a panellled parapet. The church has an open-timber roof with a pitchpine beaded ceiling and arceding on each side, supported by narrow octagonal columns. The side and end galleries are provided with panellled fronts, and the choir-gallery and organ-chamber are erected behind the rostrum. The total length is 76ft., with a width of 43ft. across the transepts. The school premises are situated at the east end of the building, and comprises a lecture-hall and nine classrooms, with scullery and lavatory accommodation. Mr. D. W. Richards, Newport (Mon.), was the contractor, and Messrs. Habershon, Fawcner, and Groves, Newport and Cardiff, were the architects.

SHOTESHAM.—Over three years ago the parish church of Shotesham All Saints underwent restoration, and no sooner was this completed, at a cost of £3,000, than the vicar turned his attention to raising funds for restoration work at Shotesham St. Mary. This has now also been completed, and the church was reopened last week. The plaster ceiling has been removed and a boarded one substituted, and the church retiled. Defects in the walls—cracked from top to bottom by ivy—have been made good. The walls have been coloured, and the seats stained and varnished. The old north doorway, blocked up with rubble, has been opened out, as have also an old doorway and two windows which were discovered in the transept. Some small fragments of painted glass, for which the church was famous in pre-Reformation times, have been discovered and placed in the window in the north transept. The roof of the tower has been re-leaded, and the old font removed and set up between the north and south doors. The two-manual organ has been improved, and St. Mary's contains a reredos of white Caen stone, erected a few years since, and is a copy of Da Vinci's "Last Supper" in Milan. The work of restoration has been carried out by Mr. Greengrass, of Shotesham.

The unveiling of the busts of Emerson and James Martineau at the Passmore Edwards settlement, Tavistock-place, by Mr. Joseph Choate, the American Ambassador, and Mrs. Humphry Ward took place on Wednesday afternoon. Mr. George J. Frampton, R.A., was the sculptor.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLVII., XLVIII., XLIX., L., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—M. J.—O. L. J.—I. N. and Son.—L. F. W. D. M. (Bristol).—L. and Son.—E. F.

TINTERN ABBEY. (A beautifully-executed measured drawing in longitudinal section of the nave of this Cistercian church, by the late Edmund Sharpe, appeared in the BUILDING NEWS for April 20, 1877. If, as you say, you have all the back volumes in stock, it will be worth your while to look it up and study it before visiting the valley of the Wye. The number has long been out of print.)—P. M. J. (In the BUILDING NEWS for June 15, 1887, is an internal view of the former nave of St. Savin's, Southwark, destroyed in 1530, drawn by F. T. Dollman, with a conjectural restoration of the groined roof which fell in 1469; Mr. Dollman's drawing, which was hung in the Royal Academy in 1877 and attracted considerable attention, was based on reliable data. Measured drawings of the choir and transepts, by G. E. S. Langford, were given in our issue of Jan. 25 and March 5, 1878, and others of Lady chapel by F. H. Tulloch, in our issue of Dec. 12, 1881. See also the more recent illustrations of the late Sir Arthur W. Blomfield's new nave, Feb. 19, March 19, and April 16, 1897.)

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"James," "D'Artagnan."

The first section of the electric tramways for Lowestoft, that from Belle Vue Park, North Lowestoft, to the northern boundary of the borough at Pakefield, has been completed, and will be formally opened to-morrow (Saturday). Work on the other section of the undertaking will not be commenced till after the visitors' season has ended.

Intercommunication.

REPLIES.

[11988.]—**Australia.**—Writing from 15 years' experience, ending 1896, your chances would be confined to Melbourne or Sydney, first; Adelaide or Brisbane, second (the latter cities hot climates). Other towns of size few. See populations, public buildings, schools, railways, &c., all Government departments, and "interest" required. Local candidates many, and, naturally obtaining the preference. Salaries outside not much above those paid in England. Ability and push required, and a twelve-months' residence, including travelling from city to city, would be necessary.—A. C. LEE, Maidenhead.

[11991.]—**Dry Rot.**—Probably "Architect" was near the truth, as dry rot rapidly increases in hot weather. Bacteria being out in their millions, and very busy everywhere. Have you proper ventilation all round below floor, by inserting iron or vitrified clay air-bricks in the wall, and above ground an inch or two? Well soak the wood with corrosive sublimate solution (cold), or a hot solution of Peters, Birtsch, and Co., Derby, Carbolicum Aveanum preparation. Wood-block flooring laid on concrete on iron joists would be a good flooring.—REGENT'S PARK.

[11991.]—**Dry Rot.**—Evidently the floor of workshop and office is in a very wet position. Thoroughly drain building and well ventilate underneath floor, as nothing will eradicate dry rot better than plenty of fresh air. If this is impossible, and as a wood floor is a necessity, I would suggest concrete and wood block laid in bitumen.—J. ASHLEY.

[11992.]—**Valuations for Probate.**—Valuation for probate: 2 per cent. on first £500 and 1½ on the excess, and out-of-pocket expenses. But it is now usual to make a bargain for a fixed and moderate sum. Valuation of land: Sixpence per acre, and out-of-pocket expenses. No fee less than five guineas. Cropping: 5 per cent. up to £100 and 2½ per cent. on the excess, and out-of-pocket expenses. Timber valuation: 5 per cent. on first £100 and 2½ on the excess, and out-of-pocket expenses. Valuation to fix rent: 5 per cent. on first £300 and 2½ on remainder of one year's rental value, and expenses. Surveyor's fees (auctioneers' and estate agents' scale): Valuation for probate or administration (under the Finance Act, 1894) of furniture and effects: 2½ per cent. up to £500, and 1 per cent. beyond that amount.—REGENT'S PARK.

CHIPS.

Lord Claud Hamilton, Chairman of the Great Eastern Railway Company, on Saturday opened the clubhouse, erected at Lowestoft by the Royal Norfolk and Suffolk Yacht Club. The clubhouse has cost about £5,000.

The old hall at South Piekenham, midway between Swaffham and Watton, Norfolk, a Neo-Greek building with cemented fronts, standing in an extensive park, having been purchased from the Applewhite family by Mr. Charles Taylor, has been demolished, and on its site a mansion of red brick and Queen Anne in style, is being erected from plans by Mr. R. W. Schultz. More than 100 men, in the employ of Messrs. Mussellwhite and Co., builders, of Basingstoke, have been at work on the new hall for the past year, and another ten months will elapse before it is ready for occupation. New cottages are also being built on the estate.

Colonel R. A. Dureford, R.E., Local Government Board inspector, held an inquiry on Friday at the town-hall, Gorton, into an application by the Gorton Urban District Council for sanction to borrow £8,816 for the provision of a refuse destructor on a site adjoining the Gorton outfall sewage works.

A Select Committee of the House of Lords passed on Monday the Local Government Provisional Order (No. 5) Bill. The object of the Bill is to confirm provisional orders granted by the Local Government Board to the boroughs of Hampstead, Holborn, and Lambeth, authorising the compulsory acquisition of land for the erection or extension of municipal offices. The London County Council appeared in opposition to the order to obtain the insertion of a clause preserving the operation of the Metropolitan Management Acts and the London Building Acts, but the committee decided not to insert the clause.

Sir Lawrence Alma-Tadema, R.A., unveiled on Monday a memorial to the late Mr. Edward Onslow Ford, R.A., erected at the junction of Abbey-road and Grove-end-road, St. John's Wood, within a few minutes' walk of the sculptor's studio. Taking the form of an obelisk, the memorial is adorned in front by a bronze replica of the figure of the sorrowing Muse seen at the base of the Shelley Memorial in Oxford, while at the back is a medallion portrait of the sculptor. The memorial was executed jointly by Mr. J. W. Simpson as architect and Mr. A. C. Lucchesi as sculptor. The pedestal is of Bath stone. We shall illustrate the memorial shortly.

In the case of Ernest Keppel Purvell, architect and surveyor, of 32, King Richard-street, Coventry, and carrying on business at 3, Earl-street, in the same city, the statement of affairs issued by the Official Receiver shows gross liabilities of £261, of which £256 is expected to rank. The assets are estimated to produce £30, and with preferential deductions the deficiency is £231.

LEGAL INTELLIGENCE.

INSURANCE OF BUILDERS: IMPORTANT TO THE BUILDING TRADE.—A case of great importance to builders was heard at the Bolton County-court on Friday, when Robert W. Kenyon, builder, Sparrow, sued the Life and Health Assurance Association, Ltd., Elinburgh, for indemnity under a policy of insurance. Mr. Adshead was counsel for the plaintiff, and Mr. Langdon represented the association. A large number of builders were in court, as the action was regarded as a test case. In November last one of plaintiffs' workmen, a man named James Crook, was working at Messrs. Blair and Sumner's bleachworks. He was helping in the erection of an iron pillar, when the pillar fell and caught Crook, who succumbed to his injury. At the county-court arbitration the window of Crook was awarded a sum of £130. Plaintiff was insured with the association, who repudiated liability and resisted the claim. Mr. Langdon, for the defence, contended that the work in which Crook was engaged was of a hazardous nature, that plaintiff did not sufficiently disclose the class of his business, that the work done by Crook did not come within the terms of the policy, and, therefore, plaintiff was not entitled to indemnity. Judge Bradbury found that the work was covered by the policy, and gave a verdict for £166 14s. 4d., with costs. It was intimated that the verdict would be appealed against.

TEMPORARY SEATS IN CHURCHES.—Messrs. W. Densham and Sons, builders, of Circus-road, St. John's Wood, were summoned at Westminster Police-court, on Friday, by Mr. Dru Drury, district surveyor for Westminster, for beginning a work before sending a building notice, as required by section 145 of the London Building Act, 1894. Mr. Daldy was counsel for the district surveyor, and Mr. R. Cunningham Glen for the defendants. It was explained by Mr. Daldy that the structure in question was a block of seats put up in the Westminster Cathedral for the purpose of the production of a piece, "The Dream of Gerontius," at the beginning of last month. The section of the Act laid it down that where a building or structure was about to be begun, the builder was to serve a notice on the district surveyor before he commenced the work, and the Act also provided for a penalty if he failed to serve that notice. In the present case notice had not been served, and the question for the magistrate briefly was whether a builder could get out of the obligation to serve a notice because he had put up a structure inside instead of outside a building. Mr. Glen urged that the case was on all fours with that of "Yeue and McDonnell," which had reference to the seats at the Agricultural Hall. Mr. Daldy: But these seats are part of the equipment of the building. Mr. Glen: I dispute my friend's suggestion that because the seats at the Cathedral may not be put back again they are, therefore, not fittings of the Cathedral. This is but an endeavour to get out of a difficult decision against him. In the case of the seats at the Agricultural Hall it was held that the section of the Act in question did not apply. Mr. Horace Smith, after looking at the case cited by counsel, said he thought he was bound by it. He regarded the present case as indistinguishable from the other. The summons would, therefore, be dismissed. Mr. Glen asked for costs, saying that the district surveyor had his attention drawn to the decision referred to. Mr. Horace Smith refused costs.

SEWAGE-DISPOSAL DIFFICULTIES AT WORCESTER.—Mr. Justice Wills and Mr. Justice Channell, in the King's Bench Division on Monday, heard a dispute between the Local Government Board and the corporation of Worcester, which arose as far back as 1891, and had reference to the carrying out of sewerage works under the Worcester Improvement Act. The Board had appealed to the Court to compel the corporation to carry out the work, and after many stages a peremptory writ of mandamus was issued. To this the corporation had made a return to the effect that they were carrying out the work. The Crown said this was not a sufficient return. The Court ordered writs of attachment against seven councillors who had been originally served with the order, but they would lie in the office until Nov. 15. With regard to the remaining forty-one councillors, the matter would stand over until Nov. 15.

LONDON BUILDING ACT, SECTION 13: ERECTION OF BUILDINGS ON STREETS (ADDITIONAL HEIGHT).—In this case it was proposed to erect a building within 20ft. of the centre of the road at a greater height than the buildings formerly existing on the site. The London County Council summoned Messrs. Patman and Fotheringham, the builders, and the case came on before Mr. Bros on July 18, 1902, at the Clerkenwell Police-court, when the magistrate dismissed the summons. The facts were not in dispute—the respondents were erecting two new buildings to be used as factories on the west side of Eyre-street Hill, which, at the place in question, is about 21ft. wide. On Thursday, May 14, 1903, the appeal came before the King's Bench Division of the High Court of Justice, the Lord Chief Justice (Lord Alverston), Mr. Justice Wills,

and Mr. Justice Channell. Mr. Horace Avory for the London County Council, and Mr. Macmorran for the contractors. Judgment has now been given. The Lord Chief Justice said that although there might be a great deal to be said on general principles that if a person is going to make more value out of an old site by erecting new buildings upon it, certain concessions might be made to the public without payment, this section, at any rate, does not enable the public to claim them. Quite apart from the decision, he thought that the magistrate was right in the view he took that this is a site section. The plan which is to be provided is a plan which will show the extent of the building and the extent of the forecourt or other open space between any external building, and then he may re-erect, but that no such land within the prescribed distance shall be occupied by the re-erected building, or structure, or forecourt, or such other open space as aforesaid (if any), except that which was occupied within the prescribed distance, and then it seems to me that the manifest intention of the section is to deal with the ground area, and the ground area only. What other restrictions there may be with regard to factories and buildings in other parts of the Act of course we have nothing to do with. Mr. Avory contended that it was not re-erection, because the construction was of an entirely different character. Apart from that, the judgment upon which the learned magistrate acted was a direct authority. Certainly there is a passage in the judgment in which the judges take exactly the same view of the section, and given it was decided that the houses were not artisans' dwellings, then the argument that re-erection meant re-erection for the same purpose, or an analogous purpose, would have arisen there. He therefore came to the conclusion that the judgment of the magistrate was right. Appeal dismissed with costs.

CHIPS.

A statue of Jules Simon, on the Place de la Madeleine, opposite the house in which he lived for over half a century, was unveiled on Sunday. M. Denys Puech, the sculptor, has represented Jules Simon standing by the side of the Tribune with folded arms. The pedestal is ornamented with two bas-reliefs, the one showing him in his study, and the other at his desk at the Sorbonne.

The sales at the Mart, Tokenhouse-yard, last week, as registered at the Estate Exchange, amounted to £276,215, as against £85,914 for the corresponding week of last year.

At their next meeting the Bradford City Council will be asked to agree to the extending of the town-hall on the site now occupied by the old conditioning house, at an estimated cost of £63,000.

A Church of England Soldiers and Sailors' Institute is in course of erection on Devonport Hill, Plymouth. It is Queen Anne in style, and contains on the ground floor recreation hall, 50ft. by 23ft., coffee hall and bar, reading, writing, and devotion and biblical room, and on the first floor are suites of married quarters of a sitting and bedroom each.

The Bishop of Clifton has solemnly blessed the new Catholic school of St. Joseph at Nymphfield. The school provides places for about 75 children, and has playgrounds attached. The work has been carried out by Mr. Thomas Cox, builder, according to the design of Mr. Walter B. Wood, A.R.I.B.A., of Gloucester.

The foundation-stone of the Baths-road Church, Roker, Monkwearmouth, Sunderland, which is to be the new home of the Dandas-street Congregationalists, was formally laid on Friday. The building, which is from designs by Messrs. Jos. Potts and Son, architects, will cost about £5,000. Mr. J. B. Stott is the contractor.

The Birmingham Electric Supply Committee have decided to recommend the appointment of Mr. R. A. Chattock, at present electrical engineer to the Bradford Corporation, to the position of city electrical engineer, in succession to Mr. J. C. Vawdrey. Seventy-nine candidates originally made applications.

As the collection of examples of British engraving and etching brought together in the galleries of the India Section of the Victoria and Albert Museum continues to attract many visitors, the Board of Education have arranged that it shall remain open until September 30 next.

Mr. H. I. Sanders, builder and contractor, of Southampton, the present Mayor of Southampton, has been elected an alderman of that borough.

For the building of the new lunatic asylum at Whitchurch, Glam., the corporation of Cardiff have accepted the tender of Messrs. King and Sons, of Westminster, at £232,390.

Two new open spaces for Wandsworth have just been opened by the mayor. One consists of two acres of land in Merton-road, Southfields, the other of an addition of two acres to the western side of the Putney Embankment.

Our Office Table.

THE syllabus of the day courses in the Studio of the Architectural Association for the session 1903-4 has just been published by Mr. H. P. G. Maule, who has recently been appointed master, in succession to Mr. A. T. Bolton. The next term opens on Sept. 28, and will close on Dec. 18; the hours are from 9.45 a.m. to 5 p.m., and 1 p.m. on Saturdays, and the fees are 15 guineas per term, or 45 guineas per annum, for the first year's course, and 10 guineas for the second year's course. The following subjects are included in the curriculum:—First year's course. The studio: The use of instruments and scales, freehand drawing, elementary perspective, orders of Classic architecture, elements of the various styles of architecture, elementary construction, and sketching and measuring details and portions of existing buildings. Lectures: History of architecture, thirty-six lectures (illustrated by visits to buildings and museums); and elementary construction and materials, thirty-six lectures (illustrated by visits to workshops and buildings in progress). In the second year the subjects taken up are the principles of architectural design, and perspective and sciography.

THE report of the trustees of the National Portrait Gallery for 1902 states that the list of donations, loans, and bequests has now been brought up to 744. The number of pictures and engravings on the walls of the National Portrait Gallery is 1,248, of works in sculpture 158, and of miscellaneous portraits exhibited in cases 41, making a total of 1,447 portraits exhibited. The trustees now report that the whole collection of framed portraits has been placed under glass with the exception of four portraits and three very large groups, which it is not deemed expedient to glaze owing to the difficulty of viewing them in their present position; they are, however, protected by barriers and placed under the constant supervision of the attendants and police. Since the issue of the last report five portraits have been provided with new frames, 32 frames cleaned and repaired, 42 portraits placed under glass, 22 metal tablets written, and four new pedestals made. The total number of visitors from January 1 to December 31, 1902, was 151,352, of whom 130,583 were admitted free of charge. In view of the approaching changes at St. George's Barracks, immediately adjoining the Gallery, the Trustees call attention to the condition of the Gallery, and to the urgent need for some future extension of the building. As this can be done only by building on some portion of the ground now occupied for military purposes, the Trustees express their hope that, in the event of any redistribution of the site now occupied by St. George's Barracks, sufficient space may be reserved for the adequate extension of the National Portrait Gallery, as soon as circumstances permit.

THE highways committee of the London County Council have prepared a scheme embracing proposals for the construction of new, and the doubling and reconstruction of existing, tramways, for which they advise the Council to seek Parliamentary power in the Session of 1904. The proposals, which are 18 in number, will in most cases involve large and costly street widenings, which the improvements committee recommend shall be carried out under certain conditions as to contributions from local authorities. Most of the schemes are revivals of former proposals which were dropped on account of the refusal of the local authorities to sanction the tramways, or, in some cases, to contribute to the cost of the street improvements. The estimated gross expenditure involved in the proposals now brought forward is £2,302,555, of which £722,230 is for street improvements and £1,580,325 for tramway construction. It is estimated that £37,430 will be realised by the sale of surplus lands. The only charge on the rates will be the outlay by the improvements committee of £228,000 on street widenings, and this will be equivalent to about £11,500, or 0.6787 of a penny in the pound. The most important of the proposed new tramways are the following:—From the Hampstead-road terminus to a point in Tottenham Court-road near Oxford-street; Westminster Bridge-road via Victoria Embankment to north side of the Strand; Greenwich to East India Dock-road via the Blackwall Tunnel; Shepherd's Bush to Marble Arch, and from Marble Arch to Cricklewood; Deptford to the Herbert Hospital, Woolwich, and

from Battersea Park-road via Battersea Bridge to King's-road, Chelsea.

THE annual exhibition of the work of the students in the London County Council Central School of Arts and Crafts is being held this week at 316, Regent-street, and will remain open to-day (Friday) and to-morrow. The school, which is under the direction of Mr. W. R. Lethaby, was established by the London County Council Technical Education Board in 1896, and supplies persons engaged in artistic handicrafts with that training in design and manipulation which, owing to the subdivision of labour in modern processes of production, they are unable to obtain in the workshop. During the past session 731 individual students joined the school, mainly apprentices and journeymen in the artistic trades. The class entries numbered 1,008, and the student hours worked amounted to 50,948. These figures are the highest yet recorded. In the stained-glass class students are assisted to learn the whole of their craft, so that they are taught to cut glass for painting on, and to lead it up when it is painted. Those who show special aptitude are encouraged to practise original composition, the study of Nature as the basis of the higher forms of ornament being insisted on. In the silver-smiths', goldsmiths', and jewellers' work, chasing, engraving, &c., the exhibits are the work of lads or journeymen ranging in age from 14 to 21 years. In the classes every effort is made to give students a broader view and practice of the craft in which they are engaged. Other sections of the exhibition include furniture and architectural designs, wood carving, enamelling, drawing from the cast, lettering, writing and illumination, and lithographic drawing. The school has long outgrown the accommodation provided in the present temporary premises in Regent-street, and plans are now being prepared for a permanent building to be erected on a site in Southampton-row allotted by the County Council for the purpose.

THE bequest of the late Mr. W. H. Cope to the Victoria and Albert Museum, South Kensington, is now exhibited in the Cross Gallery. Attention may be called to the fine examples of carvings in jade, crystal, and other stones from China and India which fill the first case. Amongst them may be noted a crystal bowl and a crystal teapot enriched with stones in gold and flowers composed of rubies, emeralds, and diamonds. On the top shelf in the same case are a pair of very fine dark-green jade candlesticks carved with flowers. The mandarin's rosary suspended at one end is a beautiful work of art. The next case is devoted to a miscellaneous collection of lacquer work, Chinese enamels, and Japanese netsukés, mostly little ivory groups, wonderfully carved. The third case contains a collection of glasses, amongst them being some tall Venetian wineglasses with stems of marvellous shape, which Mr. Cope acquired at the Magniac sale. In this case likewise are some dark blue glass flagons with painted ornament, formerly in the famous Bernal collection. Specimens of Chinese porcelain fill the two remaining cases, and form in themselves quite a representative collection. There are examples of biscuit-body vases of the "famille verte," and wine-pots in the form of mythical lions; bottles and jars with blue and white decoration; vases with splashed glazes, hitherto unrepresented in the museum; a very rare powdered blue bottle in the form of a triple gourd, enriched with polychrome flowers in white panels; and a very considerable collection of eggshell cups and saucers and plates of the Chien-lung period (1736-1795), most delicately painted with flowers and figures.

CANON CLAYTON, the Vicar of St. Mary Magdalene's, Oxford, beside whose church the well-known Martyrs' Memorial was built sixty years ago, publishes a letter from Mr. H. W. Moore, F.R.I.B.A., throwing cold water on the alarmist statements that have been made respecting this beautiful monument of the Early Gothic Revival days. Mr. Moore points out that a pyramidal structure of such a form as the Martyrs Memorial cannot collapse, and the only decay apparent is on the surface of a few richly worked stones, some of which have fallen out, but always within the railed inclosure, without risk to passers-by. The facework has sealed in places owing to the weather, and the drapery of some figures shows signs of perishing; but all these defects are, Mr. Moore candidly points out, but superficial. His opinion is that it is premature to contemplate anything like a general restoration of the monument at the present time;

it can be safely postponed for some years to come. The only recommendations which Mr. Moore now makes are (1) that the steps forming the platform (some of which have slipped out of place) should be reinstated; and (2) that the gutter running behind the parapet of the first stage should be thoroughly cleaned and rendered watertight. Canon Clayton adds that should the time come when a thorough restoration is necessary, he and his churchwardens will appeal to the public for funds, but that period has certainly not arrived.

A PROVISIONAL scheme for a systematic record of ancient defensive earthworks and fortified inclosures in this country has been prepared by the committee appointed at the Congress of the Archaeological Societies on July 10, 1901. The committee suggest that secretaries of the various archaeological societies, and other gentlemen likely to be interested in the subject, should be pressed to prepare schedules of the works in their respective districts, in the hope that lists may eventually be published. The list should be confined to defensive works, omitting burial barrows and boundary banks. Though record should be made of any "finds" indicative of period of use of the forts, no effort need be made to assign a definite period of construction, excepting in those cases in which the age is beyond question—e.g., camps and fortified settlements of undoubted Roman origin, or inclosures of proved Neolithic, Bronze, or Iron age. The committee now consists of the following members:—Professor Boyd Dawkins and Professor B. C. A. Windle, Mr. W. J. Andrew, Mr. A. R. Goddard, Mr. I. Chalkley Gould, Mr. W. H. St. John Hope, Mr. J. Horace Round, and Mr. W. M. Tapp. The committee hopes that the issue of the provisional scheme will enlist the earnest co-operation of archaeologists and observers in all parts of the country, and thus serve towards the preservation from mutilation or destruction of these priceless relics which no laws protect.

THE annual report of the work done under the supervision of the building plans committee of the Leeds Corporation for the 12 months ending March 25 has just been issued, and gives evidence as to the steady extension of the town, though the total number of plans submitted last year was only three in excess of the year before, and falls below the number sent in during 1901, 1900, and 1899. The number of plans approved (2,208) is, with one exception, higher than has been the case since 1898. The number of buildings approved was 8,971, as compared with 7,828 in 1902, 8,952 in 1901, and 9,439 in 1900. Some 559 house plans were approved, representing in all 3,529 houses, of which 38 were villas, 177 semi-detached villas, 912 through houses, and 2,402 back-to-back houses. There were 31 miscellaneous plans, including designs for two churches, three chapels, nine schools, and four factories. During the year ended March 25, 1903, 2,572 houses were completed and certified for occupation. These comprised 18 villas, 99 semi-detached villas, 892 through houses, and 1,563 back-to-back houses, whilst 1,809 miscellaneous buildings were erected.

A FRIENDLY cricket match was played on the Butts Ground on Saturday afternoon last between teams of the employés of Waygood and Otis, Limited. The eleven of the cricket club run in connection with the London works visited the city to meet a scratch eleven representing the Vulcan Iron Works, Coventry. The home team batted first, Hiorns and Farren opposing the bowling of Case and Phillips. A fair beginning was made. Though Hiorns gave an early chance, he batted steadily. Farren made a big leg hit for five, and then, through a misunderstanding, Farren failing to respond to a call, Hiorns was run out at 22, of which he had made 12. Partnered by North, Farren went on by driving Case to the boundary; but the bowler had his revenge in the next over, shattering North's wicket. Sutton, next man, had a lucky escape from being run out, and soon after skied Phillips into his own hands. Harriden then succumbed to Phillips, and four men were out for 32. Clayton went in, and Farren made a good stroke to the leg boundary, and the pair soon showed a strengthened score, but after a spirited stand had brought in 38 in quick time, Clayton was clean bowled in the first over of Dawson. The fresh bowler proved effective. In his second over he fetched out Reynolds, breaking the stump. Loud cheers greeted Punshon's first run, gained by skying Phillips in the slips, and escaping by a miracle. He only survived, however, to make a couple of brilliant strokes off the same bowler. At seven

for 79, Farren was joined by J. V. Reynolds, and shortly after attained his half-century with a big hit across the ground, which was run out for six. He was out i.b.w. at 93 for a freely hit 56. Reynolds and Raynbird stuck together gamely, the latter batting in capital style till at 120 he was beaten by Phillips. Rose, the last man in, was bowled first ball, and the innings closed after an hour and three-quarters—a very respectable show for the homesters. Case had three wickets for 24, Phillips four for 45, Dawson two for 21, and Stacey one for 19. Coventry Works XI. total 120: London XI. all out for 94.

THE scheme for providing huge monolithic columns for the Cathedral of St. John the Evangelist in New York, now in course of erection from designs by Messrs. Heins and La Farge, of New York, has proved impracticable. The cathedral is to have 32 granite columns in the choir, each 54ft. high and 6ft. in diameter, their weight being 160 tons each. It was intended that these columns should be monoliths, but it was found impossible to turn such huge blanks even in the great lathe which was built to receive them. The blanks weighed 310 tons, and they were placed on the lathe, whose bed is 86ft. long; this bed weighs 135 tons and swings 6ft. 6in. Eight tools were used, each taking a 3in. cut. The turning operation proceeded smoothly, the lathe was operated day and night, and the first column lacked only a few hours of completion, when late one night it broke in two, entailing the loss of a year's time, to say nothing of the valuable piece of stone. The second monolith never reached the polishing stage, for it gave way while being rounded into shape. The accident is attributed to the great torsion which deformed the block beyond the modulus of elasticity. The third attempt was also a failure, and the company deemed it inexpedient to risk any more columns of the monolithic type, so they are now being made in two sections. They will be towed to New York from Vinalhaven, Maine, on a barge, four sections at a time, and will be landed at the foot of West 32nd Street, and they will then be rolled to the cathedral. Had it been possible to produce the monoliths, they would only have been exceeded in size by those of St. Isaac's Cathedral, in St. Petersburg.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—St. Paul's Ecclesiological Society. Vi-it to Chigwell under guidance of R. Howard Wall. Train from Liverpool-street to Chigwell, 2.44 p.m.

THE ARCHITECTURAL ASSOCIATION.

JULY 25th: FOURTH SUMMER VISIT—to Waltham Abbey, Waltham Church, and Coppell Hall, Essex. Train leaves Liverpool-street at 2.44 p.m., returning from Waltham Cross at 7.40 p.m. P.O. 3s. 6d. (including rail, tea, and drink) to be sent to the Secretary, at 36, Great Marlborough-street, before FRIDAY, July 24th.

H. P. G. MAULE } Hon. Secs.
H. TANNER, Jun. }

At the parish church, Whitechurch, Oxon, on Saturday last, Mr. Elward W. Mountford, F.R.I.B.A., of Munstead Grange, Godalming, was married to Dorothy, second daughter of the late A. G. Hounsham, of Heathside, Hampstead Heath, and of Mrs. A. G. Hounsham, of 91, Cannon Hill, N.W., and The Cottage, Pangbourne.

Mr. Lawrence W. Chubb, secretary to the Commons and Footpaths Preservation Society, 25, Victoria-street, S.W., informs us that the Wiltshire County Council has now definitely declined to protect the public rights prejudiced by the obstruction, by means of a high barbed-wire fence, of all the roads leading to Stonehenge. The society has reluctantly been forced to appeal for funds to enable the question to be brought before a Court of Law. The society hopes to raise a guarantee sum of £2,000.

A committee of the House of Lords passed, on Tuesday, the preamble of the London County Council's Tramways Bill, so far as relates to Tramway No. 3, three miles in length, starting from the borough boundary of Hammersmith, north of Wormwood Scrubs, and terminating in the Hammersmith Broadway, also No. 6 and 6A, short sections of double line from Wimbledon-road to the line already authorised in Garratt-lane, Wandsworth.

The London County Council on Tuesday approved, subject to certain conditions, the plans submitted by Mr. F. Matcham, on behalf of Mr. Oswald Stoll, of a building to be known as the Coliseum, which it is proposed to erect upon the site of houses abutting upon St. Martin's-lane, Bedfordbury, and May's Buildings.

An adjudication has been made in the case of Ernest Kappel Purnell, of Coventry, architect and surveyor.

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Fulbourn Asylum, Cam-
bridge.
Hampstead Workhouse.
Royal Albert Hospital,
Lancaster.
General Hospital, Leeds.
St. George Asylum,
Middleton.
Romford Infirmary.
Royal London Ophthalmic
Hospital.
British Home for
Incurables, Streatham.
South Eastern Hospital.
Seamen's Hospital, Royal
Albert Dock.
Warneford Hospital.
Isleworth Infirmary.
Home for Coloured Poor,
Philadelphia.
Howard Hospital, Phila.
Parker Home, Phila.
Banstead Asylum.
Sanitary Hospital,
Bournemouth.
Convalescent Homes,
Bognor.
Hospital for Women,
Chelsea.

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Roman Catholic Hospital,
Fatland, Pa.
Royal South Hants
Infirmary.
Royal Infirmary, Shef-
field.
Stafford General Hospital.
St. Mary's Hospital, Pad-
dington.
Claybury Hall Asylum,
Woodford.
Richmond Infirmary.
Paisley Infirmary.
St. Francis Hospital,
Pittsburg.
Convalescent Home,
Pegwell Bay.
Middlesex Hospital,
London, Block 2.
Epilepsy and Paralysis
Hospital, London.
North Staffordshire In-
firmary.
St. Mary's Hospital,
London, Block 2.
Victoria Hospital for
Children, Chelsea.
Evelina Hospital,
Southwark.
Richmond Infirmary,
Block 2.
Union Hospital,
Ashton-under-Lyne.

Many of the above are New Buildings; others are large Additions or Reconstructions, and have been carried out to the entire satisfaction of the Architects.

Estimates Free, on receipt of Pencil Tracings showing the Supporting Walls, on application to—

MARK FAWCETT & CO. 50, QUEEN ANNE'S GATE,
WESTMINSTER, S.W.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN JUNE.—The month's memorandum prepared by the Labour Department is based on 3,278 returns—viz., 2,103 from employers, or their associations, 1,140 from workmen and trade-unions, and 35 from other sources. Employment in June showed some decline as compared with May. As compared with a year ago, employment continues to show a falling off. In the 226 trade-unions, with an aggregate membership of 556,695 making returns, 24,801 (or 4.5 per cent.) were reported as unemployed at the end of June, as compared with 4.0 per cent. in May, and 4.2 per cent. in the 224 trade-unions, with a membership of 544,893, from which returns were received for June, 1902. The mean percentage of unemployed returned at the end of June during the past decade was 3.9. In the building trades, employment continues moderate, showing no marked change as compared with a month or a year ago. The percentage of unemployed trade-union members among carpenters and joiners was 3.4 at the end of June, compared with 2.6 at the end of May, and 3.0 a year ago. The percentage for plumbers was 7.6 at the end of June, as compared with 6.4 in May and 5.5 per cent. in June, 1902. In the furnishing and woodworking trades, employment remains fair in the furnishing trades, and about the same as a month ago. With coopers it is still bad; with mill-sawyers it is fair on the whole. The percentage of unemployed trade-union members at the end of June was 3.0, as compared with 2.8 in May and 2.9 in June, 1902.

BRICKSETTERS' LABOURERS IN CONFERENCE.—The Manchester and Lancashire district of the Bricksetters' Labourers Society met in conference at the Oddfellows' Hall, Eccles, on Friday, under the presidency of Mr. Burn, of Liverpool. A resolution was passed appealing to all men to join trades-unions and to support Labour representatives in Parliament, so that a Bill may be placed on the Statute Book giving trades-unionists the power to dispose of their funds as they may think proper in regard to "picketing" and lock-outs, &c., and also amend the Workmen's Compensation Act in regard to the 30ft. limit on the height of buildings in course of erection, and other matters.

NEW YORK.—Twenty thousand skilled builders' workmen resumed work on Monday, and thirty thousand more on Tuesday and Wednesday. Unions numbering fifty thousand adherents having accepted the employers' terms. The effect of these is to do away with the walking delegate. Provision is also made for the appointment of a Joint Arbitration Board to settle trade disputes. Many builders' labourers and a large number of other unskilled hands resumed work.

The dedication took place on Sunday of the new reredos just erected at St. Erth Church, West Cornwall, by the Harvey family of Hayle. The reredos is constructed entirely of West of England grown oak. It is in the 15th-century style of Gothic art, occupying the whole of the space beneath the great east window, and is made from a design by the Rev. R. Medley Fulford, formerly F.R.I.B.A. The work has been carried out by Messrs. Harry Hems and Sons, of Exeter.

The death is announced at the age of 83 years of Mr. T. Stanton, for many years a builder and contractor at Torquay. He retired from business about fifteen years ago.

In the grand hall of the Royal Hospital, Chelsea, on Tuesday, Field-Marshal Sir Henry Norman unveiled a portrait in oils of the late governor of that institution, Field-Marshal Sir Donald Stewart. The portrait, which is three-quarter length, and was painted by Mr. Frank Brooke, hangs in a prominent position at the end of the hall, the subject being represented in full uniform with medals and decorations.

The Edinburgh Town Council on Tuesday, while deferring a final decision, gave favourable consideration to a request for a site in West Princes-street Gardens for a memorial to the Royal Scots who fell in South Africa. It was stated that the monument would cost £3,900. It will be an equestrian statue of a trooper to be executed by Mr. W. Birnie Rhind, A.R.S.A., of Edinburgh.

At their meeting on Saturday, the Metropolitan Asylums Board approved of alterations being made in the Fountain Hospital buildings in order to minimise the risk of fire, as advised by the architects, Messrs. T. W. Atwinckle and Son, in their memorandum, at a total estimated cost of £13,200; and decided that application be made to the Local Government Board for their sanction to this course.

The Anstruther Harbour Commissioners decided on Monday to appoint Mr. Henderson, C.E., Burntisland, to draw out plans for the repair of the west pier, which is considered to be in a tumble-down state, at a cost of £2,000.

LATEST PRICES.

IRON, &c.		Per ton.	Per ton.
Rolled-Iron Joists, Belgian	£5 10 0	to	£5 15 0
Rolled-Steel Joists, English	8 10 0		8 15 0
Wrought-Iron Girder Plates	7 0 0		7 5 0
Bar Iron, good Staffs	8 5 0		8 10 0
Do., Lowmoor, Flat, Round, or Square	20 0 0		20 0 0
Do., Welsh	5 15 0		5 17 6
Boiler Plates, Iron—			
South Staffs	8 15 0		8 15 0
Best Suedhill	9 10 0		9 10 0
Angles 10s., Tees 20s. per ton extra.			
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.			
Builders' Hoop Iron, galvanised, £12 to £13 per ton.			
Galvanised Corrugated Sheet Iron—			
No. 18 to 20.	No. 22 to 24.	Per ton.	Per ton.
ft. to ft. long, inclusive		£11 15 0	£12 0 0
gauge		15 5 0	12 12 6
Best ditto		Per ton.	Per ton.
		£6 10 0	£8 10 0
Cast-Iron Columns		8 5 0	8 5 0
Cast-Iron Stanchions		6 15 0	6 15 0
Rolled-Iron Fencing Wire		8 5 0	8 5 0
Rolled-Steel Fencing Wire		4 12 6	4 12 6
Galvanised		9 5 0	9 5 0
Cast-Iron Sash Weights		9 0 0	9 0 0
Cut Clasp Nails, 3in. to 6in.			
Cut Floor Brads			
Wire Nails (Points de Paris)—			
to 7 8 9 10 11 12 13 14 15 B.W.G.			
5/6 9/0 9/3 9/8 10/3 11/0 11/3 12/6 13/8 per cwt.			
Cast-Iron Socket Pipes—			
4in. diameter	£5 15 0	to	£8 0 0
6in. to 6in.	5 12 6		5 17 6
7in. to 24in. (all sizes)	5 0 0		5 10 0
[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 0d. per ton extra.]			
Pig Iron—		Per ton.	
Cold Blast, Lillieshall	105s. 0d.	to 112s. 6d.	
Hot Blast, ditto	65s. 0d.	to 70s. 0d.	
Wrought-Iron Tubes and Fittings—Discount off Standard Lists l.o.b. (plus 3 per cent.)—			
Gas-Tubes	67½ p.c.		
Water-Tubes	62½		
Steam-Tubes	57½		
Galvanised Gas-Tubes	55		
Galvanised Water-Tubes	50		
Galvanised Steam-Tubes	45		
10cwt. casks. 5cwt. casks.			
	Per ton.	Per ton.	
Zinc, English (London mill)	£26 10 0	to	£27 0 0
Do., Vieille Montagne	27 5 0		27 15 0
Sheet Lead, 3lb. and upwards	14 0 0		14 0 0
Lead Water Pipe (F.O.R. Lond.)	14 10 0		14 10 0
Lead Barrel Pipe	15 2 6		15 2 6
Lead Pipe, Tinned inside	16 2 6		16 2 6
Do., and outside	17 12 6		17 12 6
Composition Gas-Pipe	16 2 6		16 2 6
Soil-Pipe (5in. and 6in. extra)	16 2 6		16 2 6
Pig Lead, in lwt. pigs	10 16 3		10 17 6
Lead Shot, in 25lb. bags	15 0 0		15 0 0
Copper sheets, sheathing and rods	71 0 0		71 12 0
Copper, British Cake and Ingot	61 0 0		61 10 0
Tin, Straits	126 10 0		127 0 0
Do., English Ingots	123 0 0		128 10 0
Spelter, Silesian	20 0 0		20 5 0
TIMBER.			
Teak, Burmah	per load £10 5 0	to	£18 10 0
" Bangkok	10 0 0		16 10 0
Quebec Pine, yellow	4 0 0		6 0 0
" Oak	4 15 0		7 10 0
" Birch	5 5 0		10 0 0
" Elm	4 12 6		9 0 0
" Ash	4 12 6		8 10 0
Danitic and Memel Oak	2 15 0		5 5 0
Fir	3 7 6		5 2 6
Wainscot, Riga p. log	2 7 6		5 5 0
Lath, Danitic, p.f.	4 0 0		6 0 0
St. Petersburg	4 0 0		6 0 0
Greenheart	7 15 0		8 0 0
Box	7 0 0		15 0 0
Sequoia, U.S.A.	per cube foot 0 3 6		0 3 9
Mahogany, Cuba, per super foot			
1in. thick	0 0 6		0 0 8
" Honduras	0 0 6		0 0 7½
" Mexican	0 0 4		0 0 5
" African	0 0 3½		0 0 5½
Cedar, Cuba	0 0 3		0 0 3½
" Honduras	0 0 3½		0 0 3½
Satinwood	0 0 10		0 1 9
Walnut, Italian	0 0 3		0 0 7½
" American (logs)	0 0 8 1		0 0 3 1
Deals, per St. Petersburg Standard, 120—12½ft. by 1½in.			
Quebec Pine, 1st	£22 0 0	to	£23 0 0
" 2nd	19 10 0		20 0 0
" 3rd	11 10 0		14 0 0
Canada Spruce, 1st	12 10 0		15 10 0
" 2nd and 3rd	9 10 0		10 10 0
New Brunswick	8 10 0		10 0 0
Riga	7 10 0		8 5 0
St. Petersburg	8 5 0		16 5 0
Swedish	11 5 0		19 5 0
Finland	8 15 0		19 0 0
White Sea	11 15 0		19 5 0
Battens, all sorts	6 5 0		13 5 0
Flooring Boards, per square of 1in.—			
1st prepared	£0 13 0		£0 19 0
2nd ditto	0 12 0		0 16 0
Other qualities	0 6 0		0 13 6
Staves, per standard M.—			
U.S., pipe	£37 10 0		£45 0 0
Memel, cr. pipe	220 0 0		230 0 0
Memel, brack	190 0 0		200 0 0

STONE.*

Darley Dale, in blocks	per foot cube	£0 2 3
Red Mansfield ditto	"	0 2 4½
Hard York ditto	"	0 2 10
Ditto ditto 6in. sawn both sides, landings,	random sizes	per foot sup. 0 2 8
Ditto ditto 3in. slabs sawn two sides,	random sizes	" £0 1 3
* All F.O.R. London.		

Bath Stone, delivered on rail at quarry stations	per foot cube	£0 1 0
Delivered on road waggons, Paddington Depot	"	0 1 6½
Ditto ditto Nine Elms Depot	"	0 1 8½
Portland Stone, in random blocks of 20ft. average:—		
Brown		
Whit Bed.		
Base Bed.		

Delivered to railway depot at the quarry	per foot cube	£0 1 5½
Delivered on road waggons at Paddington Depot	"	0 2 1
Ditto Nine Elms Depot	"	0 2 2½
Ditto Pimlico Wharf	"	0 2 2½

FEVRE AND CO.

Blocks Palotte Banc Franc	1 5	per c ft. ex. steamer London.
Ditto ditto Banc Royal	1 3	do. do.
Ditto Euville	1 9	do. do.
Ditto Comblanchette	3 0	do. do.
Ditto Massangis (Roches)	2 6	do. do.

OILS.

Linseed	per tun	£21 0 0	to	£21 5 0
Rapeseed, English pale	"	24 0 0		24 5 0
Do., brown	"	22 10 0		22 15 0
Cottonseed, refined	"	22 15 0		23 0 0
Olive, Spanish	"	32 0 0		33 0 0
Seal, pale	"	26 0 0		26 0 0
Cocoonut, Cochian	"	33 0 0		33 10 0
Do., Ceylon	"	25 5 0		25 15 0
Palm, Lagos	"	27 10 0		27 15 0
Oleine	"	17 5 0		19 5 0
Lubricating U.S.	per gal.	0 7 0		0 8 0
Petroleum, refined	"	0 0 5½		0 0 5½
Tar, Stockholm	per barrel	1 6 0		1 6 0
Do., Archangel	"	9 18 6		1 0 0
Turpentine, American	per tun	87 0 0		87 5 0

CHIPS.

The Essex County Council are about to borrow £30,000 for the rebuilding of Barking and Ilford Bridges and the purchase of the site for the new county lunatic asylum at Colchester.

The Bignold Cottage Hospital was formally opened at Wick on Monday by Sir Felix Semon, London, one of the King's physicians. The hospital is the gift of Mr. Biguold, M.P. The building, with additions and structural alterations, cost upwards of £3,000, and includes ten wards and operating-room.

Mr. H. Ross Hooper has held an inquiry at Watford into the application of the urban district council for sanction to borrow £1,500 for purposes of electric lighting.

The Mayor of St. Pancras (Alderman W. H. Matthews) unveiled, on Tuesday, a cross of Sicilian marble, which has been erected by public subscription, over the grave of Mrs. W. D. Walters, wife of the Rev. W. D. Walters, and mother of the Rev. C. Easor Walters, in Highgate Cemetery. Mrs. Walters lost her life in saving a little child from being run over by a heavy dray at Woolwich, on October 8, 1902. The memorial is in the form of an Irish cross, bearing a figure of the Saviour blessing little children, and the words, "Ye have done it unto Me."

The partnership hitherto subsisting between F. F. Nichols, E. C. Nichols, and G. Chuter, architects, &c., Howard-street, Strand, London, W.C., under the style of D. Cubitt Nicholls, Sons, and Chuter, has been dissolved, so far as regards E. C. Nichols.

The west-end window of St. Andrew's Parish Church, Hingham, Norfolk, has been filled with stained glass as a memorial to the late Lady Augusta Noel. The central subject is the Angel proclaiming the Resurrection to the faithful women, whilst in the background Jesus Christ is appearing to Mary Magdalene. At the foot are the arms of the Albemarle and Noel families, also those of the Province of Canterbury. The artist is Mr. Herbert Bryan.

A new church is about to be built at the corner of Sandhurst and Torridon-roads, Lewisham, from plans by Mr. Philip A. Robson.

An inquiry in connection with the application of the Ballymena Urban District Council to the Local Government Board for Ireland for a loan of £29,000 for the purpose of purchasing and extending the local gasworks was held last week by Mr. A. D. Price, M.Inst.C.E., in the urban council chambers, town-hall buildings, Ballymena.

The memorial-stone of a Baptist mission-hall was laid at Yarmouth last week. The hall will be one floor in height. It is being built by Mr. C. C. J. Cayley, of Stanley-road, Yarmouth, and will be 36ft. long and 26ft. wide, with a height of over 30ft. over all. The exterior is of red brick, and the roof will be open timberwork inside.

LIST OF COMPETITIONS OPEN.

Taunton—Carnegie Library (limit £5,000; Assessor)	£30 (merged), £20, £10.....	George H. Kite, Town Clerk, Municipal Buildings, Taunton	July 20
Stonehaven—Additions to Town Hall .....	.....	George Murdoch, Burgh Surveyor, Stonehaven, N.B.	Sept. 12
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen ..	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Swansea—Type of Terrace House for Working Classes.....	£10 10s.	The Borough Surveyor, Somerset-place, Swansea	—
Cloverhill—Infectious Diseases Hospital .....	.....	David W. Shaw, District Clerk, 5, Wellington-square, Ayr.	—
Acton, W.—School (250 places) (Assessor).....	5 per cent.; £30, £20	B. S. Gott, Clerk to Governors, Guildhall, Westminster.....	—

LIST OF TENDERS OPEN.

BUILDINGS.

Aberbeeg—Twenty Houses	No. 3 Aberbeeg Building Club	P. Vivian Jones, P.A.S.I., Architect, Hengoed	July 18
Lairhill—Alterations to Farm Offices.....	.....	Davidson and Garden, Aberdeen.....	" 18
Stanhope—Altering Police Station	Durham County Council	W. Crozier, A.M.I.C.E., County Surveyor, Shire Hall, Durham.....	" 18
Pontypridd—Additions to Working-Men's Club	School Board	A. O. Evans, F.S.I., Architect, Pontypridd	" 18
Shaugh Prior—Master's House .....	.....	H. J. Soell, Architect, 11, The Crescent, Plymouth	" 18
Ashton—Additions to Grammar School .....	.....	R. E. Tucker, Clerk to Governors, Ashton	" 18
Sedgefield—Additions to Police Station	Durham County Council	W. Crozier, A.M.I.C.E., County Surveyor, Shire Hall, Durham.....	" 18
Nethermuir—Alterations to House and Farm Offices.....	Guardians	Davidson and Garden, 12, Dee-street, Aberdeen	" 18
Smallburgh—Additions to Workhouse .....	.....	John T. Lee, Architect, 26, Great James-street, Bedford-row, W.C.	" 18
Broadbampton—Renovating Wesleyan Chapel	Corporation	The Rev. W. L. Waights, Ashton	" 18
Eccles—Destructor Buildings	Urban District Council	G. W. Willis, Sewage Works Engineer, Peel Green-road, Patricroft ..	" 18
Stretford—Additions to Town Hall	School Board	E. Worrall, Surveyor, Council Offices, Old Trafford	" 20
Bridgewater—Extension of Albert-street School .....	.....	Samson and Cottam, Architects, 43, High-street, Bridgewater	" 20
Fenay Bridge—Three Houses .....	.....	Jas. Berry, Architect, 3, Market-place, Huddersfield	" 20
Clydach Vale—Forty-Eight Workmen's Cottages	Cambrian Collieries, Ltd.	Leonard W. Llewellyn, Cambrian Collieries, Ltd., Clydach Vale ..	" 20
Lancaster—Pig Slaughter-Houses.....	Properties Committee	T. Cann Hughes, Town Clerk, Town Hall, Lancaster	" 20
Fleetwood—Bakery, London-street	Industrial Co-operative Society ..	Tom G. Lumb, Architect, Estate Office, Fleetwood, Lancs	" 20
Grassington—Residence	Education Committee	Empsall and Clarkson, Architects, 7, Exchange, Bradford	" 20
Bristol—School, Dean-lane, St. George	Urban District Council	La Trobe and Weston, Architects, 20, Clare-street, Bristol	" 20
Witham—Engine-House, Chimney Shaft, and Water-Tower.....	School Board	W. Bindon Blood, Clerk, Witham, Essex.....	" 20
East Ham—School (1,592 places), Monaga-road	Workmen's Institute Committee ..	R. L. Curtis, 120, London Wall, Moorgate-street, E.C.	" 20
Ton—Hall .....	.....	Jacob Rees, Architect, Pentre	" 20
Llanberis—Additions to Nant Padarn Congregational Chapel.....	J. Oram	Henry Thomas, Architect, Carnarvon	" 20
Midsummer Norton—Cottage, Redfield-road.....	Burial Board	Stanley J. Gregory, Architect, Combe Hill House, Radstock	" 20
Rehington—Additions to Sexton's Lodge at Cemetery	Clyde Navigation Trustees	William Griffiths, Architect, 5, Hamilton-square, Birkenhead.....	" 20
Glasgow—Reconstructing Two-Story Goods Shed .....	.....	T. R. Mackenzie, General Manager, 16, Robertson-street, Glasgow ..	" 20
Pontypridd—Rebuilding Masons' Arms	Bethel Coop. Chapel Trustees ..	E. A. Johnson, F.R.I.B.A., Abergavenny	" 20
Miskin—Chapel	James and Morgan, M.M.S.A., Charles-street Chambers, Cardiff ..	T. W. Millar, Architect, Mountain Ash	" 20
Deri—School	Corporation	James and Morgan, M.M.S.A., Charles-street Chambers, Cardiff ..	" 20
Lancaster—Flooring Classroom	H.M. Commissioners of Works	T. Cann Hughes, Town Clerk, Town Hall, Lancaster	" 21
Manningtree—Additions to Wesleyan Schools	Co-operative Society	J. W. Start, F.S.I., Architect, Cups Chambers, Colchester	" 21
Buckingham Palace—Coach-house, &c., at Royal Mews.....	London County Council	J. B. Westcott, H.M. Office of Works, Storey's Gate, S.W.	" 21
Trowbridge—Warehouse, Church-street .....	.....	W. W. Soallum, Architect, Church-street, Trowbridge	" 21
New Cross-road, S.E.—Excavating and Levelling Site .....	.....	The Architect's Dept. (Highways), 13, Charing Cross-road, S.W.	" 21
Stairfoot—Villa	Lancashire and Yorkshire Ry. Co.	E. W. Dyson, Architect, 14, Market-hill, Barosley	" 21
Manchester—Foundations for New Buildings	Guardians	The Engineer's Office, Hunt's Bank, Manchester	" 21
Haslingden—Farm Buildings	Lancs. and Yorks Railway Co.....	James Kerr Hay, Clerk, Union Offices, Pikelaw, Rawtenstall.....	" 21
Bootle—Timber Yard	Trustees	The Engineer's Office, Hunt's Bank, Manchester	" 21
St. Austell—Enlarging Capital and Counties Bank	H.M. Commissioners of Works	F. C. Jury, Architect, 1, Tregonissey-road, St. Austell, Cornwall ..	" 21
Manningtree—Additions to Wesleyan Sunday Schools .....	.....	J. W. Start, F.S.I., Architect, Cups Chambers, Colchester	" 21
Tooting, S.W.—Sorting Office	Guardians	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 21
Buckfastleigh—Pointing and Rough-casting Church Spire	Queen-street Building Society	Andrew Warren, Surveyor, Buckfastleigh	" 21
Lichfield—Four-Bed Observation Wards at Workhouse	North-Eastern Railway Co.....	D. C. Marks, A.R.I.B.A., St. Mary-street, Lichfield	" 22
Blaugav—Thirty-five Cottages .....	.....	J. Morris Williams, Architect, Blackmill	" 22
Todmorden—Post Office, Pavement .....	.....	Jesse Horsfall, F.R.I.B.A., Todmorden	" 22
Church Fenton—Station Buildings .....	.....	William Bell, Architect, York	" 22
Whitehaven—Mission Sunday School	Deacons	J. S. Moffat, M.S.A., Architect, 53, Church-street, Whitehaven.....	" 22
Neath—Repairs to Bethlehem Green Church	J. Tait	Philip Thomas, Gnull Park-road, Neath	" 22
Beamish—House and Shop .....	.....	T. Ernest Crossling, Architect, Front-street, Stanley, R.S.O.	" 22
Edinburgh—Shelter, Roseburn Public Park .....	.....	R. Morham, City Architect, City Chambers, Edinburgh	" 22
Linthwaite—Branch Store .....	.....	J. Berry, Architect, 3, Market-place, Huddersfield	" 22
Norwood, S.E.—Painting and Repairing Schools	Lambeth Guardians	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	" 22
Whiteham—Eight Cottages	H.M. Commissioners of Works	Hanington and Co., Ltd., Newcastle-on-Tyne.....	" 22
London, S.W.—Superstructure of New Admiralty Buildings.....	.....	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.	" 22
Whitehaven—Sunday School	Southwark Union Guardians	J. S. Moffat, M.S.A., Architect, 53, Church-street, Whitehaven.....	" 22
East Dulwich-grove, S.E.—Repairs at Infirmary	T. N. Cook	G. D. Stevenson, Architect, 13, King-street, Cheapside, E.C.	" 23
Waterside, N.B.—Two Covered Courts	School Board	The Cluny Estates Office, 16, Union-terrace, Aberdeen	" 23
Currie—School	Essex County Council	Wm. Baillie, Architect, 223, Hope-street, Glasgow	" 23
Westcliff—Two Houses for Police Officers .....	.....	F. Whitmore, County Architect, Duke-street, Chelmsford	" 23
Bargoed—Additions to Greyhound Inn	Heston and Isleworth U.D.C.	D. F. Pritchard, Western Valters Brewery, Crumlin, Mon	" 23
Hooalaw—Boiler-House, &c.	P. Gunn	H. J. Baker, Clerk, Town Hall, Hounslow	" 23
Moresby—House	Southwark Union Guardians	G. S. Stout, Architect, 36, Lowther-street, Whitehaven	" 23
Blackfriars-road, S.E.—Decorative Repairs at Union Offices ..	.....	G. D. Stevenson, Architect, 13, King-street, Cheapside, E.C.	" 23
Port Talbot—C.M. Chapel, Grove-place	Essex County Council	J. Rees, Glynderwen, Grove-place, Port Talbot	" 23
Grays—Additions to Police Station	Corporation	F. Whitmore, County Architect, Duke-street, Chelmsford.....	" 23
Tamworth—Rebuilding Chimneys at Town Hall	H.M. Commissioners of Works	F. E. G. Bradshaw, Boro' Surveyor, 36, Aldergate, Tamworth ..	" 23
Rhymney—Stable and Coachhouse .....	.....	T. Roderick, Architect, Glebe-lane, Merthyr Tydfil	" 24
Barrow-in-Furness—Enlargement of Post Office .....	.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 24
East Svala, Paversham—Coastguard Station .....	.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 24
Merthyr Tydfil—Post Office .....	.....	R. G. Wilson, Architect, 1814, Union-street, Aberdeen	" 25
Rothie-Norman—Bark House	Wesleyan Trustees	Arthur O. Evan, Pontypridd	" 25
Hafod—Chapel and Schoolroom	School Buildings Club	R. L. Roberts, Architect, Abercrom	" 25
Wauwilwyd—Twenty Houses	Building Committee	G. Morgan and Sons, Architects, Carmarthen	" 25
Duffryn Gwaun—Rebuilding Jabez Chapel	Town Council	John P. Seddon, Architect, The Vicarage, Walton-le-Dale, Preston ..	" 26
Walton-le-Dale—Church .....	.....	Chancellor and Son, High-street, Chelmsford	" 27
Chelmsford—Library, Museum, and School of Art .....	.....	T. Roderick, Architect, Glebe-lane, Merthyr Tydfil	" 27
Rhymney—Ninety-one Houses .....	.....	Richard Holt, Architect, Liverpool	" 27
West Hartlepool—Upper Grade School (1,200 places) .....	.....	G. H. Tait, Architect, Lowfield-street, Darford	" 27
Dartford—Wards and Buildings at Workhouse	Highways Committee	William Bruce, Architect, Greek-street Chambers, Leeds	" 27
Leeds—Additions and Alterations to Offices	Devon County Council	E. H. Harbottle, County Architect, Exeter	" 27
Exeter—Offices at the Castle	Graig Rhymney Building Club ..	T. Roderick, Architect, Glebe-lane, Merthyr Tydfil	" 27
Turphill—Twenty-eight Houses	Tramways Committee	H. Goldyear, A.M.I.C.E., Boro' Eng., Town Hall, Colchester ..	" 28
Colchester—Tramcar Shed	County Council	W. Crozier, A.M.I.C.E., County Surveyor, Shire Hall, Durham ..	" 28
Durham—Education Offices	Hackney Union Guardians	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.	" 29
Chipping Ongar—Children's Homes	Guardians	Joseph Shepherdson, Architect, Driffield	" 30
Driffield—Additions to Workhouse Infirmary	Town Council	Charles Jones, M.I.C.E., Engineer, Town Hall, Ealing	" 30
Ealing, W.—Slipper Baths, Williams-road	Borough Council	John Morgan, Secretary, 68, Robert-street, Ypsyswyl	" 30
Ypsyswyl—Restoring Noddfa Welsh Baptist Chapel	Corporation	J. Bower, Borough Surveyor, Town Hall, Gateshead	" 30
Gateshead—Stables, Tyne-road East	Pleasant View Building Club ..	The Borough Surveyor's Office, 15, Market-place, Devizes	" 30
Devizes—Converting Town Hall into Public Offices	Admiralty	T. Roderick, Architect, Clifton-street, Aberdeen	" 30
Aberaman—Seventy-two Houses	Gas Committee	The Director of Works, Admiralty, W.C.	" 31
Hayling Island—Coastguard Station	Markets Committee	Fletcher W. Stevenson, Engineer, Gasworks, Coventry	Aug. 1
Coventry—Sulphate House, &c.	London County Council	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury ..	" 3
Shrewsbury—Covered Cattle Sale Ring	L. & N.W. and G.W. Jt. Railways.....	The Housing Section, Archt.'s Dept., 18, Pall Mall East, S.W.	" 4
Brickfield Gardens, N.E.—Bandstand, Conveniences, &c.	Trinity Corporation	A. E. Bolter, Sec. to Joint Committee, Paddington Station, W.	" 4
Shrewsbury—Railway Station	Trustees	Corderoy, Selby, and Corderoy, 21, Queen Anne's Gate, S.W.	" 6
Portland Bill, Dorset—Lighthouse Dwellings .....	.....	The Director of Works, Admiralty, Northumberland-avenue, W.C.	" 7
Embsay, Anglesea—Coastguard Station .....	.....	Anthony and Sons, Anchor House, Kidwelly	" 15
Kidwelly, Wales—Alterations to Calvinistic Methodist Chapel ..	.....	Travers and Ramsden, Architects, 44, Church-st., Leigh, Lancashire ..	" 17
Newchurch—Rebuilding Church .....	.....	J. Llewellyn Smith, Architect, Aberdare	" 26
Tredyffell—Boys' School (400 places) .....	.....	Wm. Hope, Architect, Seymour-road, Hampton Wick	" 31
Leamington—Public Offices, Fire Station, &c. ....	.....	.....	.....

BUILDINGS—continued.

Swadlincote—Repairs to Hastings-road Board School	Church Gresley School Board	C. F. Underhill, Architect, Station-street, Burton-on-Trent
Long Eaton—Factory	Mickley Social Club Company	E. R. Ridgway, M.S.A., Architect, Long Eaton
Mickley—Club	Mrs. D. M. Crane	W. Dixon and Son, Architects, St. John-street, Newcastle
Steer Point—Five Cottages	Middleton Estate & Colliery Co., Ltd.	Corderoy, Selby, and Corderoy, 12, George-street, Plymouth
Much Hadham—Detached Residence at Perry Green	Urban District Council	Ansell and Ansell, Architects, Harrow
Stalybridge—House, Norman-road	J. Lanes	Thomas George and Son, Architects, Ashton-under-Lyne
Leeds—Offices, Great Wilson-street	University of Wales	Edwin Hill, Architect, 13, Oxford-road, Leeds
Hunstanton—Houses on Glee Estate	Phoenix Brewery Co., Ltd.	G. Fitt and Co., Ltd., Architects, 50, Princess of Wales-rd., Norwich
Dalton-in-Furness—Carnegie Free Library	School Board	W. Richardson, Surveyor, Council Offices, Dalton-in-Furness
Carmarthen—Two Houses, Parnham Building Estate	Misses Cowbird	A. Soppitt, Solicitor, Carmarthen
Cardiff—Registry Offices	J. R. and John Jacob	Frederick W. Brown, Architect, Clifford-street, York
Gildersome—Wesleyan Sunday Schools	Phoenix Brewery Co.	J. B. Thurnley, Architect, Market-street, Darwen
Bury—Offices at Green-lane Brewery	Corporation	Ivor James, Registrar, Brecon
Dronfield—Warehouse and Offices	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	Garside and Pennington, Architects, Pontefract
Wombwell—School	The City Surveyor's Office, Town Hall, Manchester	Wm. E. Gill, Architect, Derby Chambers, Fleet-street, Bury, Lancs
Heywood—Alterations at Advertiser Office	S. E. Fedden, Manager, Commercial-street, Sheffield	Gibbs and Flockton, Architects, 15, St. James-row, Sheffield
Cartmel—Altering House	W. H. Tittensor, C.E., 25, Burrow-road, Preston	J. Robinson, Architect, Park Cottage, Wombwell
Ilkeston—Congregational Church and Schools	Lacey and Sillar, Engineers, 78, King-street, Manchester	Wm. E. Gill, Architect, Fleet-street, Bury, Lancs
Cardiff—Three Shops and Offices	J. and J. S. Enright, 47, Victoria-street, S.W.	John Stalker, M.S.A., Architect, Kendal
Belfast—Resulating Presbyterian Church	Wm. Bruce, Architect, Greek-street Chambers, Leeds	H. Tatham Sutbury, Architect, 18, Market-place, Ilkeston
Heywood—Offices at Phoenix Brewery	Morley and Dawson, 82, Victoria-street, S.W.	Habershon, Fawcner, and Co., Architects, 14, Pearl-st., Cardiff
	The Clerk, L.C.C., Spring Gardens, S.W.	Robert T. Martin, 7, Wellington-place, Belfast
	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Wm. E. Gill, Architect, Fleet-street, Bury, Lancs
	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	

ELECTRICAL PLANT.

Weymouth—Electric Lighting Plant	Corporation	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	July 18
Manchester—Laying Telephone Pipes	Paving Committee	The City Surveyor's Office, Town Hall, Manchester	" 20
Sheffield—Electricity Meters	Electric Lighting Committee	S. E. Fedden, Manager, Commercial-street, Sheffield	" 21
Preston—Plant at Tramway Power Station	Corporation	W. H. Tittensor, C.E., 25, Burrow-road, Preston	" 22
Swindon—Seven Electric Trams	Corporation	Lacey and Sillar, Engineers, 78, King-street, Manchester	" 23
Hounslow—Electric Lighting Plant	Heston and Isleworth U.D.C.	J. and J. S. Enright, 47, Victoria-street, S.W.	" 23
Leeds—Electric Lighting Offices, &c.	Highways Committee	Wm. Bruce, Architect, Greek-street Chambers, Leeds	" 27
Blackburn—Switchboard, &c.	Town Council	Morley and Dawson, 82, Victoria-street, S.W.	" 29
Pietermaritzburg—Electric Trams	Corporation	The Clerk, L.C.C., Spring Gardens, S.W.	Aug. 11
Camberwell and New Cross, S.E.—Switchboards	London County Council	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Sept. 12
Sydney—Generating Set	N.S.W. Railway Commissioners	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	" 28
Launceston, Tasmania—Electric Meters (500)	Corporation		

ENGINEERING.

Edinburgh—Dust Screen at Powderhall Destructor	Magistrates and Council	The Burgh Engineer, 1, Parliament-square, Edinburgh	July 18
Brigg—Cleaning Portion of Ancholme Navigation	Ancholme Drainage Commissioners	Alfred Atkinson, Engineer, Brigg	" 18
Eastby—Windmill Pump	Guardians	Fred. Holland, Architect, 11, Hustler-gate, Bradford	" 18
West Ancland—Widening St. Helen's Bridge	Durham County Council	W. Crozier, A.M.I.C.E., County Surveyor, Shire Hall, Durham	" 18
Cork—Pump at Ringaskiddy	Rural District Council	John Cotter, Clerk, Workhouse, Cork	" 18
Brechin—Water Supply Works	County Council	A. A. Symon, C.E., Arbroath	" 18
Eccles—Steam Engine	Corporation	G. W. Willis, Engineer, Peel Green-road, Patricroft	" 18
Gateshead—Reconstructing Low Team Bridge	Corporation	William Crozier, A.M.I.C.E., County Engineer, Durham	" 18
Weymouth—Lancashire Boilers	Tramways and Electricity Board	Kennedy and Jenkin, 17, Victoria-street, S.W.	" 18
Stalybridge—Suction Tanks, &c.	Urban District Council	Frank Schofield, Clerk, Town Hall, Stalybridge	" 20
Pontypridd—Reconstructing and Widening Various Bridges	Town Council	P. R. A. Willoughby, A.M.I.C.E., Council Offices, Pontypridd	" 20
Dovercourt—Landing-Stage on Beach	Rural District Council	H. Ditcham, Borough Surveyor, Harwich	" 20
Knarborough—Waterworks	Urban District Council	Richard Anakin, C.E., 11, Dragon-place, Harrogate	" 20
East Ham—Road Scarifier	County Council	The Chairman of Works Committee, Town Hall, East Ham	" 21
Byfleet—Rebuilding Two Bridges	Chertsey Rural District Council	W. Durrant, Surveyor, Spinney Hill, Addlestone, Surrey	" 21
New Cross-road, S.E.—Excavating and Levelling Fairlawn	London County Council	The Architect's Dept., 13, Charing Cross, S.W.	" 21
Stenney, E.—Pipework, &c.	Borough Council	Arthur Wright, Consulting Engineer, 27, Osborn-st., Whitechapel	" 21
Mountain Ash—Laying Gas-Mains	Urban District Council	John Williams, Town Hall, Mountain Ash	" 21
Hebden Bridge and Luddenden Foot—Widening Railway	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	" 21
Rathdown—Well	Rural District Council	E. M. Butler, M.I.C.E., 12, Dawson-street, Dublin	" 22
London, E.C.—Deck Bridges, &c.	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, E.C.	" 22
Poplar—Water-Softening Plant	Guardians	C. F. Herbert Lough, Clerk, Upper North-street, Poplar, E.	" 22
Kirby Sigston—Iron Bridge over Cadeck	Rural District Council	W. Fowle, Clerk, Northallerton	" 22
Whittingham—Water-Supply Works	Isle of Wight R.D.C.	H. Eldridge Stratton, Clerk, Pyle-street, Newport, I.W.	" 22
Rhondda—Laying Water Mains	Urban District Council	Octavius Thomas, Gas Offices, Centre, R.S.O., Glam	" 23
Aldeburgh—Shallow Well	Corporation	James Mansergh and Sons, 5, Victoria-street, Westminster, S.W.	" 23
Rhondda—Sulphuric Acid Store Tank	Urban District Council	Octavius Thomas, Gas Offices, Centre, R.S.O., Glam	" 23
Sligo—Lining Well	Rural District Council	M. F. Conlon, Clerk, Court House, Sligo	" 25
Dartford—Heating Apparatus at Gore Farm Upper Hospital	Metropolitan Asylums Board	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 25
Sligo—Pump	Rural District Council	M. F. Conlon, Clerk, Court House, Sligo	" 25
Cheadle—Steel Girder Tramway Rails (350 tons)	Chendale and Gately U.D.C.	C. E. Brady, A.M.I.C.E., 13, Warren-street, Stockport	" 27
Walsend—Steel Hopper	Corporation	George Hollings, Borough Surveyor, Walsend	" 27
Aberystwith—Timber Breakwater	Corporation	A. T. Walmisley, Engineer, 9, Victoria-street, Westminster	" 27
Longton—Detritus Tanks, &c.	Town Council	J. W. Wardle, A.M.I.C.E., Borough Eng., Court House, Longton	" 28
Penitton—Weir at Penny Bridge	County Council	H. Michelmore, Clerk, Castle of Exeter	" 28
Chelmsford—Two Steam Road-Rollers (10-ton)	Essex County Council	P. J. Sheldon, Chief Surveyor, Chelmsford	" 28
Edinburgh—Sewage Works	Sevenoaks Rural District Council	Baldwin Latham, M.I.C.E., Victoria-street, Westminster	" 29
Burnley—Water Cistern in Workhouse Grounds	Guardians	S. Edmondson, Surveyor, 18, Nicholas-street, Burnley	" 29
Manchester—Machinery, &c., for Victoria Baths	Baths Committee	The City Architect, Town Hall, Manchester	" 30
Withington—Reservoir	Urban District Council	A. H. Mountain, A.M.I.C.E., Surveyor, West Didsbury	Aug. 1
Coventry—Underground Liquor Tank	Gas Committee	Fletcher W. Stephenson, Engineer, Gasworks, Coventry	" 1
Glasgow—Laying Water-Piping	Corporation	D. McCall, Supt., City Chambers, 65, Cochrane-street, Glasgow	" 3
Glasgow—Three Washing-Machines	Corporation	W. Thomson, Manager, 187, George-street, Glasgow	" 3
Manchester—Distribution and Discharge Apparatus	Rivers Committee	The Secretary, Rivers Department, Town Hall, Manchester	" 4
Tenbury—Laying Cast-Iron Pipes	Rural District Council	Wilcox and Raikes, Engineers, 63, Temple-row, Birmingham	" 5
Kettering—Storage Reservoir	Urban District Council	T. Reader Smith, Engineer, Market-place, Kettering	" 10
North and South Shields—Floating Lading Stages	Tyne Improvement Commissioners	Robert Urwin, Secretary, Bewick-street, Newcastle-on-Tyne	" 22
Belfast—Graving Dock	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast	" 31
Valletta, Malta—Lift Construction	Public Works Committee	The Receiver-General and Director of Contracts, Malta, Valletta	Oct. 30
Birmingham—Reconstructing Hay Mills Bridge		John Price, City Engineer, Council House, Birmingham	"

FENCING AND WALLS.

Arith—Oak Pale Fence, South-road	Urban District Council	Chas. H. Fry, Clerk, Erith, Kent	July 20
Thornhill—Boundary Wall at Coombe Top	Urban District Council	J. H. Dyson, Clerk to Council, Thornhill	" 21
Rhondda—Boundary Wall round Isolation Hospital	Urban District Council	W. J. Jones, Engineer, Centre, Glam	" 21
Winchester—Fences, &c.	Town Council	The City Surveyor, Guildhall, Winchester	" 28
Liverpool—Unchainable Iron Fencing (250 yards)	Select Vestry	H. J. Hagger, Vestry Clerk, Brownlow-hill, Liverpool	"

FURNITURE AND FITTINGS.

Blackburn—Bedsteads, &c., at Workhouse Infirmary	Guardians	Fredk. C. Ruddle, Architect, 4, King-street, Blackburn	July 22
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PAINTING.

Broadhempston—Wesleyan Chapel	Sanitary Committee	The Rev. W. L. Waights, Ashburton	July 18
Manchester—Public Urinals and Lavatories	Corporation	The City Surveyor's Office, Town Hall, Manchester	" 18
Batley—Eight Houses, Princess-street	Committee	John H. Brearley, Architect, Branch-road, Batley	" 18
York—Various Properties	Committee	A. Cree, City Engineer, Guildhall, York	" 20
Llanberis—Nant Padarn Congregational Chapel	Town Council	Henry Thomas, Architect, Carnarvon	" 20
Grassington—Residence	Guardians	Emmott and Clarkson, Architects, 7, Exchange, Bradford	" 20
Portsmouth—Interior of Municipal Technical Institute	Urban District Council	Alexander Hellard, Town Clerk, Town Hall, Portsmouth	" 20
Thrapston—Centre Portion of Workhouse	Urban District Council	Gerard Hunnybun, Clerk, Thrapston	" 20
Pontypridd—Bridges, Abutments, and Small-Pox Hospital	Northumberland County Council	P. R. A. Willoughby, A.M.I.C.E., Council Offices, Pontypridd	" 21
Stairfoot—Villa	London County Council	Ernest W. Dyson, Architect, 14, Market-hill, Bursley	" 21
Newcastle-on-Tyne—Moot Hall	Joint Hospital Board	A. Bean, County Surveyor, Moot Hall, Newcastle-on-Tyne	" 21
Newlyn—Vivian House and Premises	Deacons	W. Rogers, 13, St. Mary's-terrace, Penzance	" 21
Blackwall, E.—Tunnel	School Board	The Engineer's Dept., County Hall, Spring Gardens, S.W.	" 21
Pudsey—Interior of St. Paul's Church	Highways Committee	The Rev. J. L. Sywell, Pudsey	" 21
Norwood—Latrie Blocks at Schools	Cent. London Sick Asylum Managers	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	" 22
Mirfield—Fever Hospital, Crossley-lane		E. Gill, Surveyor, King-street, Mirfield	" 22
Neath—Chapel		Philip Thomas, Gnoil Park-road, Neath	" 22
Poole—Interior of Guildhall		John Elford, Borough Surveyor, Poole	" 22
Currie—School		Wm. Bullie, Architect, 223, Hop-street, Glasgow	" 23
Leeds—Offices and Workshops		Wm. Bruce, Architect, Greek-street Chambers, Leeds	" 27
Hendon, N.W.—Asylum, Colindale-avenue		Wm. Lockwood, Architect, 33, Gerrard-street, Soho, W.	" 27
Great Broughton—Schools		R. Telford, Fern Cottage, Great Broughton	"

THE BUILDING NEWS AND ENGINEERING JOURNAL.

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FRIDAY, JULY 24, 1903.

STUDENTS' WORK.

AT this time of the year the interest attaching to the work of students of the London County Council Central School of Arts and Crafts is made obvious by the annual exhibition of students' work, which we briefly noticed last week. An examination of the different crafts reveal decided progress in design and workmanship. Much of this is due to the direction of Professor W. R. Lethaby and his colleagues. Comparing the present with the earlier results of the school, which was established by the Technical Education Board of the L.C.C. in 1896, it is not difficult to trace the influence of the inculcation of sound art principles upon those engaged in artistic handicrafts. Before this school and other influences had made themselves felt the craftsman had a very unsatisfactory idea of art: he thought, from the method of its teaching, that it was something foreign to his own craft; an addition of extraneous ideas and methods; a something which had to be learned in a school and applied whenever the occasion arose. By the subdivision of labour and processes the craftsman had only a partial idea of his art from the training he received in the workshop. In the designs for architectural subjects and furniture we notice this influence in a very marked degree. The designs for a country house, for example, show a desire to break through conventional methods, and to rely upon honest means of effect, though perhaps a little too much is devoted to picturesqueness rather than to plan in the disposition of the rooms and means of access. The design by Vincent Hooper exhibits some inventiveness in the plan in the octagon bay or hall and kitchen offices wing. The grouping externally of the octagon feature is pleasing; red brick and tile roof are shown, and the drawings are well executed. The design by Alick Horsnell, Chelmsford, is also simply treated in dark red brick, but the passage between dining-room and kitchen is long. G. A. Bryan has for the same subject a brick and stucco treatment; the plan is less satisfactory in the staircase and passage round pantry and the corridor above. The details are well drawn. In the design of Fred. G. Mitchell a similar external treatment is adopted, with high tile roof. Unnecessary labour is shown in the patterns of tile paving, to the confusion of plan, which is skilfully drawn. A wide corridor, a dining-room, 26ft. by 16ft., and a drawing-room 24ft. by 16ft., which are entered from the former, and a serving-room next kitchen and pantry, are features of the plan. The details are cleverly drawn to $\frac{1}{4}$ in. scale. For a suburban house, Frank H. Porthall sends a four-storied red brick and tile-roofed design, with roughcast in gable and upper story. The plan shows a large drawing-room and a small dining-room. The entrance lobby arrangement looks awkward in the elevation. A design for a private hotel, by F. G. Mitchell, is a five-storied building, the entrances and corners marked by red brick and stone quoins. The author shows on one side a restaurant entrance to the ground floor and a private hotel entrance on the other side. The restaurant is divided into tables and seats, and has a recess. On first floor there is a large lager-beer saloon, and bedrooms above, with kitchen, &c., in basement. Two sets of drawings represent a school for 300 juniors (mixed). One by G. H. Yeoman has a central hall, 54ft. by 34ft., lighted at one end and by dormers, with two classrooms on each side, 25ft. 6in. by 20ft. The

lobbies and cloak-rooms are placed at south-west end of large hall. The design by Harold Hutton Christie for the same subject resembles a similar type of plan: the entrances are placed at each side of the end of hall, and the elevation is rather better. There is still room for improvement in the external design; the gable end of the first design is needlessly cut up. A rather straggling and ill-devised plan for a country house is by S. Hubert Parry, who shows a design of a picturesque character. A small model of a country house, simple in plan, and quite square in its main walls, with the kitchen offices made a low projection, is also set. The external walls are brick, and roughcast above, with hipped tile roof. Amongst other work are measured drawings of Nixon's School, Oxford (now demolished), by Harold E. Wheeler. The interesting colonnade of the ground story, and the quaint gabled windows of English Renaissance character above, are drawn with firmness. It is an interesting example of old work. The designs for special features are few, and do not appear to take very well. A design for dining-room with ingle nook, is simply treated in the panelled walls and ceiling, and the details show knowledge. A small hall is another subject, by W. Kruger, drawn to $\frac{1}{4}$ in. scale; also a design for hall chairs of oak inlaid with ebony. The flat-cut balusters to staircase are suitable. We also notice suggestions for oak dining-table with carving, drawings of furniture from the South Kensington Museum; a mahogany writing-table. A design for dresser in oak has been sensibly treated by J. Robinson and Percy J. Smith; also suggestion for a sideboard in oak, with carved centre panel and bright steel fittings, is very cleverly treated. The designs of rush-bottom chairs in oak with square upright backs are too stiff and crude, and indicate the direction of the "New Art" movement. We also notice a design for a bishop's crosier in silver, with rock crystal, by M. C. Oliver, who also shows a design for a wrought gold pectoral cross, with sapphire centre and of good section. T. Gibson contributes designs for a silver casket, a saltcellar and spoon, and a candlestick in brass.

The sketches for figure composition, by J. H. M. Bonner, in colour and chalk, exhibit good arrangement and composition; one is based on the "Holy Grail." The compositions of M. J. Dawson and another are creditable.

The modelling and casting for silversmiths' work are chiefly the work of lads or journeymen, ranging in age from 14 to 26 years. The subdivision of labour and the machine methods introduced have often led to mechanical production, in which each lad is kept to one kind of article. Many apprentices to these trades have joined the classes without the most rudimentary knowledge of their trade. It is to supply this deficiency of the workshop that these classes are established; and in the silversmiths' classes the student is assisted individually in the design and execution of the work which does not form part of his workshop labour. One of the modelled specimens is an unfinished panel, "Flodden Field," after a sketch by Burne-Jones, by Albert J. Wilkins. A chalice, designed by Onslow Whiting, with wrought medallions, after Sir E. Burne-Jones, is well modelled. A horse modelled from the round is also clever. A case of beaten copper vessels, chalices, vases, and bowls, by various students, is interesting as evidence of a right motive in design and simplicity of treatment. H. S. Swinnerton and other students contribute specimens. The goldsmith work, jewelry, including brooches, bracelets, rings, combs, include a few designs exemplifying a proper sense of material. A broader basis of design is evident in these works, the object of the leading instructors in each class is to draw out

the craftsman's inventive powers within proper limits. In the modelling and sculpture room many life studies and designs are exhibited. Some of these give proof of decided ability. We can only mention the arch and spandrel, with figures in high relief, by G. D. Macdougald; the panel and figures by F. Lessore, a panel by M. J. Dawson, life studies by J. Lessore and Dawson. A small figure panel by the latter artist and Amy A. Wilkins, figure panels by H. W. Page, capital of pilaster by E. J. Singer, and life studies by Amy A. Wilkins of a girl's head, and another head in relief by E. Barton. The woodcarving and gilding is limited chiefly to carved frames, in which the carving or conventional scrollwork is inclosed by moulded edges and is in flat relief. These frames compare favourably with the meretricious and rococo carving we see on most modern gilt picture frames. The student is confined to the simplest elements that can be carved with the gouge, and is allowed to exercise his own inventive power in the design of the carving which is in strict keeping with wood. The wood inlaying is seen in the cabinetwork. We notice that great reserve is used: the inlays are introduced just where they give relief, and point to the design of the woodwork. The stained-glass work shows a true appreciation for correct design in the leadwork and colours, and the student is taught the controlling influence of leading and cutting in the design. He is taught the whole of the craft, instead of only one branch. We notice a few very excellent figure examples based in Italian art by G. F. Brodwick, by C. Presswell—a subject after Giovanni Bellini; also by Miss Bertha Bell, the Louvre Madonna after Botticelli. The patterns for "quarries" for diapers, heraldic and other accessories, show that fundamental elements of design are not overlooked. Original composition in this class of work is encouraged, and the study of nature and life studies of the school are enlisted as the basis of design. A case of enamelled work comprises many good specimens in this craft, including necklets, waistbelts, and work by Eva J. Nelson, M. L. Allis, J. Lindsay Black, M. C. Stevens, Dora M. Durlacher, Bertha Goff, and others. The woodcut in colour is a very interesting development of pictorial art, in which broad effects of tinting are produced by the simplest means. "An outline of the design is made upon thin paper, which is pasted face downwards upon smooth cherry-wood. A delicate cutting is then made along both sides of the line throughout the design, the cutting being so light as merely to break the surface of the wood. With curved chisels shallow depressions are then hollowed out between the cut lines. Subsequently, from impressions taken from this key-block and pasted upon fresh planks, cuts are made round the various shapes on the blocks required to print the coloured forms in the design." The gradations of tone are made by the printer's own skill in laying the colours (dry powder colours mixed with water and a little rice-paste) upon the wood blocks and in the use of the rubber. Many hundreds of impressions can be taken from one set of blocks. The specimens of these coloured woodcuts show the usefulness of the art, which can be applied to simple picture-books as well as designs. Lithography is shown by a few examples by Miss Dinaker, A. Weddington, Miss Harding, &c. Designs for wallpaper embroidery and the cases of book-binding are of interest, as are also the studies for lettering. In future it would be better to print the names of the students, as some of them are unreadable. A high standard of design and craftsmanship has been attained, which is highly encouraging to the school directors and managers.

The Board of Trade inspection of the electric tramways at Batley will take place on Monday next.

FIRE-RESISTING BUILDINGS.

FEW questions affecting building are of more urgent importance than those which relate to fire-prevention, and it is mainly in great cities that they chiefly apply. Good sanitation may be of more far-reaching consequence to the residents in our towns, bad drainage and defective plumbing may decimate our population; but these matters are both remediable to a great extent, whereas inflammable construction and predisposing causes of fire are not so easily dealt with. And the principles of fire-prevention have a more controlling influence on building, as they require the selection of materials and the adoption of methods of construction which have a more or less radical influence on the design. The profession will learn something by a careful perusal of the papers read and discussions that have been made at the International Fire Prevention Congress, convened by the British Fire Prevention Committee, and which we have reported in the last two weeks' issues. The conference on such a subject is valuable, because it shows how varying the conditions that prevail are. As Dr. Edward Atkinson, president of the Boston Manufacturers' Mutual Insurance Company, pointed out in his paper on the "Prevention of Loss by Fire in the United States," the problem presented to the underwriters of the United States is quite different from any problem that could be found in any European country, especially in Great Britain, by reason of the exceptional variations of climate and temperature that prevail in the United States. He says: "Within the great section which extends from the Atlantic to the Pacific between parallels of latitude 33° to 45° N., where are found the larger part of the population, the greater number of factories and workshops, the principal cities and public buildings, and by far the greater number of the school buildings, there are very great variations between summer and winter; the common range of the thermometer being from 30° below zero, sometimes lower to 90°, sometimes higher." The variation in humidity is also large. Then the conditions of American building varies in respect of the materials. The abundance of timber, resinous and hard wood, and the scarcity of good building stone, such as that used in France and Belgium or England, are well-known facts.

It happened, therefore, as the author says, that the best material for the construction of dwelling-houses in the early stages of towns and cities, and throughout the States, is wood rather than brick or stone. Again, he points out that brick and stone are not the best materials when exposed to the extremes of temperature or of humidity. When used without precautions in building thick walls with air spaces, they are alternately affected by heat and cold and dampness in excess, from which properly-constructed wood buildings are free. Brick and stone in an extremely cold winter become intensely cold, gathering humidity from the air within the dwelling, making the house damp and very difficult to heat. In the hot weather brick and stone buildings will heat rapidly, and, unless built with cavity walls, are intolerable to live in. On the other hand, wood is a good non-conductor of heat and cold, and when used in thick masses, the building is warmer in winter and cooler in summer, and more easily heated and ventilated than any other kind. These are well-established facts. When stone or brick is used, thick walls with air cavities become necessary to insure an equable temperature, and the result is better and less expensively obtained by using wood with a properly-constructed roof. These facts point to the very opposite conditions of the two countries. Nature has furnished America with the material that is best suited to her climate in abundance. In

the British Isles we have no conception of these extremes of temperature on buildings. If we had such experience, many of our brick buildings would be impossible to dwell in comfortably. The builders in America have, it appears, not seriously thought of a change of material, but, as the author of the paper says, reverted "to the heavy timber construction of the Colonial period and the disposal of plank and timber within brick or stone walls in such a way that there may be no concealed spaces through which fire may pass out of reach of water." Factories built under the control of the Factory Mutual Underwriters have been constructed on this system. No effort has been made to construct fireproof mills and workshops; but by means of regulative measures and safeguards they have been rendered tolerably safe. Had more substantial materials been employed, these buildings would have become costly, and hence incapable of being converted, and it is considered undesirable that any factory or workshop should be planned to last more than 25 years. The textile factories and other industrial buildings of fifty years ago were narrow and several stories in height; but this type is superseded by buildings of not more than three stories in height for carding and spinning, and one-story shops for weaving and machinery are now built. Ribbed or prismatic glass is used to diffuse the light over the whole area. The upshot of Dr. Atkinson's paper is to show that these temporary unsafe wooden structures have been both necessary and expedient in the development of the country, that more permanent building would have absorbed capital and have been an encumbrance, and that the methods of construction of the United States have been adapted to climate, to materials, and to conditions of progress. Well organised and equipped fire departments are made necessary under these conditions. Among the more useful safeguards the author mentions the automatic sprinkler, which is being introduced on a large scale, and is found to abate more than one-half of the loss by fire. The losses by fire occur chiefly in buildings which are capable of being protected by sprinklers, standpipes, and hydrants at vantage points and upon the roof. The self-sustaining steel-frame building is a new problem alike to underwriters and engineers, and the Factory Underwriters soon began to discount the idea of incombustible materials being indestructible by fire, and have required that unprotected steel beams should not be used to support plank floors, and cast-iron columns have been discarded for square wooden posts. Dr. Atkinson says: "The experience of the underwriters who insure the steel-frame buildings has not justified the great confidence with which the work was undertaken. Very destructive fires have occurred in buildings of this type which have been filled with combustible contents. Several of the methods of protecting steel from heat have failed, and while the building has stood well and has been capable of repair, there has been much damage by heat, especially in the upper stories. It has proved that the prevention of loss by automatic sprinklers is as necessary in an incombustible building as it is in any other." Fires causing little damage have generated so much suffocating smoke as to make them dangerous in a panic. The engineering experiment station, established by the mutual underwriters, for testing by fire and laboratory experiment methods of fireproof construction, are now investigating the subject of protecting steel from corrosion, another element of destruction which promises to shorten the "life" of the steel skyscraper. From these facts it is clear that any conclusions drawn as to the means of fire-prevention in this country will not necessarily apply to buildings in the States or *vice versa*. Each country has to solve the problem in its own way. We have been, during the last decade

or so, arriving at certain stages. We have found by experience and laboratory experiments that certain incombustible materials like iron and stone are fraught with serious hazard in structures in which combustible goods are stored; that certain modes of protecting the metal are almost useless; and we have had to unlearn many of the principles which are considered at first to be infallible.

In the Section on Building Construction and Equipment, Mr. Arthur Pordage, fire-master, Edinburgh, contributed a few useful suggestions from his experience in combating fire. He observed that what is intended as a safeguard often becomes a danger. Several points of so-called "fireproof" materials which deserve consideration may be referred to. One general dictum or principle is made the starting point—namely, that materials which meet the requirements of fire-resisting buildings from the fireman's point of view are those which are not subject to the laws of expansion and contraction when exposed to heat. Here we have a principle to work upon which will exclude iron, stone, glass, and many other materials used in fireproof buildings, and Mr. Pordage says the results of the tests of time point to timber, bricks, mortar, and good plaster as not subject to the laws of expansion. The ordinary wood floor with a plastered ceiling comes under this rule. Such a floor has been found to stand the effects of a fire for an hour, and though it burned through in places, the firemen were able to pass over it. The author of the paper suggests that a well-constructed floor of this kind would resist fire even better. The ends of the joists should be well bedded in the walls, the flooring boards should not be less than 1 in. thick, tongued together, the spaces between the joists filled with pugging, and the ceiling coated with 1 in. of good plaster on wire laths. We have the practical opinion of a fire-expert that such a floor would resist a fire from top or underside sufficiently long to enable any fire brigade to complete their toilet before turning out and arrive in time to do good work and prevent floors from collapsing. Large floors which require to be supported are best aided by solid timber supports or columns, which become only charred on the surface. Mr. Pordage says if these wood posts were wire-lathed and plastered they would come out unscathed. Even when large spaces demand iron girders and columns, these should be protected; but the floor itself should be of timber, which, being a non-conductor, would remain in position. It is well known that steel joisting and concrete do not stand fire well: the concrete cracks and falls in patches, and does damage to the floors below. Experience at large fires has shown that firemen can depend on a wooden floor, while the "fireproof" one begins to break away directly the heat attacks it, the result of which is they cannot direct their efforts safely from the inside. The arguments are certainly strong from this point of view. The divisions into sections or "risks" of the interior of a building by partition is another question of equal urgency, for a fire spreads with alarming rapidity unless it is checked by barriers. Partitions act in this capacity, and according to their impermeable and non-conducting nature the spread of fire is impeded, or its progress greatly checked. Lath-and-plaster partitions are, of course, flimsy safeguards. They should be solid, of fire-resisting material, and there are a few patented materials, like the "Mack" partition or the Uralite slab, which will effectually check the progress of fire from one room to another if solid brick cannot be used. A solid partition, if carried up through the building, the joists going through them solidly so as to prevent any connection or space between one floor and the next, as in the case of hollow partitions, is a valuable barrier. The same objection to "fireproof" materials is urged against the stone or concrete stairs

unless built in a separately inclosed well, so that fire and heat cannot touch them, and the same author we have mentioned recommends solid hardwood as the most reliable under all circumstances. This we know is disputed by some authorities. We have to consult the experience of the fireman in these cases. A solid wood staircase, filled in with pugging and coated with good plaster, is found to be more reliable as a means of communication. Such a stair will remain in position long after it is possible for any human being to pass up and down it, while a stone stair would be unendurable, and liable to fly to pieces directly the hose is applied. Solid hardwood steps pinned into the wall securely will only become charred to a certain depth, and will remain of service for a longer time. The stone staircase, with ends pinned into the walls, has repeatedly broken or fractured near the wall end, and the whole staircase has fallen suddenly, as one did at the Polytechnic many years ago, if we remember aright. Experts, too, recommend for roofs just those kind which the artistic mind revolts against. Probably the best form of roof that is fire-preventive is a flat, solid roof of steel and concrete and asphalt, which would confine the fire, and prevent its bursting through too soon, while the flat roof would assist the firemen in their arduous task of extinguishing the flames in the rooms below. On the other hand, the favoured high roof with a large space underneath allows the fire to penetrate through the upper ceilings and to extend over the whole building or series of houses, unless each is kept separate by well-built party-walls carried up at least 3ft. above the roof. This is certainly a danger in the high, hollow roof of timber; it is suggested that the divisional walls should have a ledging of 24in. round the edge, which would admit of men working on it, and a means of saving life and attacking a fire. The light iron-trussed roof is, of course, preferable to pine timber in roof construction, with this end in view.

Perhaps the greatest aid to combustion and fire extension in buildings is the match-boarded partitions and ceiling. This is an employment of timber of the worst and most hazardous kind, for it admits the air behind it, and the wood being thin, dried, and of a soft, resinous kind, becomes most inflammable. The paint or varnish adds to the danger. Hard woods for wall or ceiling coverings are less objectionable if fixed solidly to wall without an air-space. In the same category we may place lift inclosures, which should be always of non-combustible material like brick, and the doors should be fire-resisting or armoured, and useful hints are given by Mr. Max Clarke, A.R.I.B.A. Lift-shafts, undoubtedly, present a very real difficulty to the architect; they are required to be light, and, as far as possible, open for light and entrance. The steel-framed inclosure, with wired or other fire-resisting glass, could be used where brick or more solid inclosures are impossible. The doors from each floor to the lift are important. They should be made to slide, and be well "armoured"; and should be close-fitting, and be secured by fastenings, to prevent buckling by heat.

The suggested sections on the London Building Act made by Mr. Dicksee, district surveyor, would assist greatly in the prevention of fire. At present the sections relating to fire have reference (1) to the separation of buildings; (2) the subdivision of the structure to confine the fire to one portion; (3) fire-resisting provisions relating to materials, &c.; (4) and sufficiency of exits. These provisions are only partially operative. The exempted sections of the Act, as we have repeatedly said, require revision. The law should have direct reference, not so much to certain limits of cubical or superficial area, as to the use of the building: whether they are filled with inflammable stocks or goods, or whether any

risky occupation, involving danger from this cause, is carried on. A greater evil and danger to the community is the existence of inflammable buildings of the worst construction, and without means of escape, with which the Act does not deal. Only new or altered buildings come under the provisions; there is nothing to make the owner of risky premises reconstruct them, or to provide means of escape for his employees in case of fire. It is not a matter of the infringement of vested interests, but the safety of tenants and workpeople in the large city warehouses—the right of the public rather than those of the individual owner. No one has a vested interest in allowing his premises to remain a danger to his employees and neighbours. The London County Council have provided for the safety of the public in theatres and other places of assembly under the Metropolis Management and Building Act, 1878. These are very stringent on the provision of exits, superficial areas on different levels, staircases, and other regulations. Old buildings for this purpose have to be reconstructed or improved, and the Factory and Workshop Act enforces regulations as to exits, stairs, &c., in old as well as new buildings. These enactments point to the urgent demands there are for rendering existing buildings safe. The means of escape from buildings are not practically dealt with at present, and when, as in the case of "Carritt v. Godson," the question has been raised, the weakness of the Act is shown. Again, tall buildings set back behind one-story shops have rendered it difficult to save the inmates in case of fire in the shops, and the building is too far back to be easily reached by the fire-escape. In all such cases fire-resisting exits through the shops ought to be provided. A more scientific classification of fire-resistance is required than now prevails. The subject demands that the limits of resistance in different kinds of buildings should be measured by other considerations than materials and methods. The degree of protection necessary in or near a city workroom filled with inflammable goods like cotton or furniture must be greater than that necessary for an ordinary dwelling-house, and the executive of the British Fire Prevention Committee are right in discriminating between fire-resisting materials and systems, and their suggested minimum standards of fire-resistance under the heads of Temporary Protection, Partial and Full Protection, are worth consideration.

QUEEN VICTORIA MEMORIAL.

PLANS this week have been on view in the tea-room of the House of Commons, illustrating the scheme as finally modified for the Grande Place which is to be set out in front of Buckingham Palace in connection with the Queen Victoria Memorial. The work of forming the plateau for this purpose is in hand, and the retaining-wall skirting St. James's Park is about to be commenced at once, because the earthwork thus undertaken and this wall will have to be finished by November next. The encircling road outside the inclosed area, which formed so conspicuous and fine a feature in Mr. Aston Webb's competition design, has been abandoned, and the traffic instead will pass in front of Buckingham Palace, much as it does at present. The monument surmounted by Mr. Brock's statue of the late Queen will be brought somewhat more forward into the Grande Place—or Queen's Garden, as it is to be called—to enable this road to be made, and in lieu of the stone colonnade with arched gateways which Mr. Webb designed in his modified scheme, a low iron inclosure railing will extend between the monument and the front of the palace. This is considered an improvement, and the opinion to that effect is based upon the appearance produced by a model to scale. It was felt that the gateways were somewhat overpowering as compared with the central feature or monument, which, of course, is the *raison d'être* of the whole thing. No doubt

it is difficult to judge merely from a drawing; but we are inclined to doubt the wisdom of the change which this low iron railing has introduced, and from a monumental and architectural point of view we can but regret that the grand roadway leading round the Queen's Garden up to the Processional avenue has been abandoned. We certainly think a great mistake is thus being committed. The inclosing colonnade will now be encumbered with the park grounds, and for such a purpose Mr. T. G. Jackson's proposal was much better adapted. A reference to our illustration of his design on Nov. 8, 1901, will demonstrate the correctness of this opinion, and no doubt his scheme was based advisedly on the assumption that the whole composition was to nestle as it were in the Park. Our illustration of Mr. Aston Webb's design appeared in the *BUILDING NEWS* for Nov. 1, 1901, and the plan in the following issue. The radius of the Queen's Garden will be 300ft., and the site of the memorial will now be laid out with flower-beds and grass-plots so as to give some idea of the ultimate form to be assumed by the permanent work.

LIVERPOOL CATHEDRAL COMPETITION.

COMMENTS have been made by ourselves and the profession generally on the acceptance of the position of joint architect to the Liverpool Cathedral by Mr. Bodley, one of the assessors in the recent competition. It is very rightly felt that, as a general principle, an assessor should have no interest, present or prospective, in the result of a competition, beyond assuring to the utmost of his ability that the best design should secure the award.

In the present instance we believe the following are the facts:—When it was ascertained that the author of the selected design was Mr. Scott, a young man of twenty-two years of age with no practical experience of building, the committee naturally felt great hesitation in placing so important a work in his hands. They at first decided to abandon the result of the competition altogether; but, under the influence of strong representations from the assessors, they afterwards reconsidered this decision, and invited Mr. Bodley to act as joint architect with Mr. Scott. This Mr. Bodley at first declined, but expressed his willingness to become "advisory" architect. The committee, however, would not agree to this suggestion, and it was plainly intimated that, unless he could see his way to taking the position of joint architect, Mr. Scott's design would be definitely abandoned. The situation thus created was a most difficult one, and in order to insure that substantial justice should be done, and that the competition, which had entailed so much thought and labour, should not prove abortive, Mr. Bodley finally agreed to the committee's wish, and became joint architect, a position which, however, he had neither sought nor desired. The publication of these facts will probably remove a good deal of misconception.

REGISTRATION OF QUALIFIED ARCHITECTS.

YORKSHIRE OPINION.

IN response to an invitation from the Royal Institute of British Architects, that the allied societies should express their opinions on the above subject, a special general meeting of the Leeds and Yorkshire Architectural Society was held on Tuesday evening in last week, the president, Mr. Butler Wilson, in the chair, when the following resolution was passed:—"Resolved—that in answer to the request of the president of the Royal Institute of British Architects, this meeting of members of the Leeds and Yorkshire Architectural Society, allied with the Royal Institute of British Architects, expresses itself in favour of the 'Statutory registration of qualified architects,' and expresses the hope that the Royal Institute will take early measures to give effect to a principle which would give our profession a recognised status, and raise the standard of architectural education and training throughout the kingdom."

The question of registration is, says the *Leeds Mercury*, now being discussed by the profession, and there is at present a Bill dealing with the matter actually before Parliament.

The statutory registration of architects infers that the right to practise under the style and title

of "architect" would be confined to those who were duly qualified to do so; and only such persons could legally sue for and recover fees for their services as architects.

It is expected that the result would be parallel to that effected by the registration of the medical and legal professions, the advantages of which, to both profession and public, have been too well proved to be referred to at length.

Registration will not prevent unqualified persons designing and superintending the erection of buildings, any more than the Medical Act can suppress quacks and charlatans; but it would at once distinguish the qualified from the unqualified, and be an act of justice both to profession and public, who would naturally hesitate to employ persons against whom they would have little chance of redress for negligence or incompetence in a Court of Law.

Those in favour of the movement are of opinion that registration would carry with it even more valuable consequences—viz., The further spread of sound architectural education and training; that registration will form the strongest inducement to our students to enter for and pass the qualifying examination on which their future status and prospects would depend. Although registration would admit, up to a certain date, architects at present in practice, who could furnish evidence of qualification to be termed such, without the test of an examination (as was the case with the medical profession), nevertheless the possible immediate and short-timed disadvantages would be far outweighed by the future gain to the rising and succeeding generations."

ON BUILDING TIMBERS.—XXXI.

TAMARAC—HACMATAC—OREGON PINE—SEQUIA.

THE greatest difficulty experienced in describing North American building timbers arises from the unfortunate practice, which is only too common, of giving the same name to different woods, and of sometimes using no less than a dozen different names for the same wood. Botanists are quite as much at fault in this respect as timber converters (lumbermen), for it is by no means rare to find the same name given to very different trees, or to discover that the same tree may be correctly called by half-a-dozen different scientific names. This confusion has arisen from the fact that when trees were first cut down for building or firewood they were hastily distinguished by purely local names, each consumer giving any species that name which best expressed in a popular way a leading characteristic of either bark, stem, branches, or leaves: botanists, too, working independently of each other, often gave fanciful names to trees which, though these were subsequently abandoned in most cases for others denoting a more accurate and scientific classification, still "stick on" in many districts as well as in the literature of the subject, much to the perplexity and annoyance of the student who tries to fathom the depths of this branch of the building trade. In the United States there are no less than twelve Ironwoods, sixteen Junipers, six Yellow Pines, eight Balsams, and others much too numerous to mention here, each name referring to different species, and often to different genera. Even in this list not one of the "Yellow Pines" referred to is that known as "Yellow Pine" in England, for they are what we call "Pitch Pine," and what is known as "Yellow Pine" here is "White Pine" in the States. Again, take Cedar as an example of this erratic naming of woods. Everyone is familiar with it in the ordinary pencil cedar, where it appears as a soft, even grained, reddish, highly scented wood; but in reality no less than seven different trees furnish wood known in the trade as "Cedar." First, the Cedars are divided into two classes by the trade, the "White" and the "Red"; then the White Cedar may be a Thuja, Chamæcyparis Thyoides, or C. Lawsoniana, or it may be a Libocedrus, and the Red Cedar may be a Juniper or a Sequoia. Our pencil Cedar is not a true Cedar, it is a Juniper (Virginiaana), so that a specification which provides for joiner's work of any kind to be of "Cedar" without naming the tree from which that cedar is to be obtained, is too vague to be of any value in determining the kind of wood the builder is to supply. Fir is another much-abused name: it is applied indiscriminately to spruce and pine, though it happens to be neither of them; it is something like Spruce, but it is readily distinguished from it as well as from Pine and Larch by the absence of resin ducts

in the wood and bark. All the Firs are now known as *Abies*, the Larch *Larix*, the Pines *Pinus*, the Spruce *Picea*, and the Hemlocks *Tsuga*. The hemlock referred to at the close of the last article sometimes finds its way into the London market, where it is known as "Hemlock Spruce," another example of confusion of names in the trade, for the Hemlocks and Spruces are different trees; it is imported from Canada, and sells for the same price as spruce, being graded in about half-a-dozen different qualities. The prices of "hemlock spruce" are as follows:—First quality, 3in. by 11in., £13; 3in. by 9in., £13; 3in. by 8in., £11 10; 3in. by 7in., £11 15s.; 3in. by 6in., £11. Fourth quality, 2in. by 6in., £6 15; 2in. by 5in., £6. Fifth quality 3in. by 8in., £7 10s.; 3in. by 6in., £7. Any builder who uses the hemlock for joinery will be surprised at the amount of shrinkage and twisting it will undergo as it dries in the seasoning.

TAMARAC.

Hacmatac is another soft wood sometimes imported here, but parcels of it are not very often met with on this side of the Atlantic; it is a Larch, and rejoices in an unusual number of names, scientific and popular. Amongst the scientific ones are *Larix Americana*, *L. Laricina*, *L. Tenuifolia*, *L. Pendula*, *L. Macrocarpa*, *L. Intermedia*, *L. Americana Rubra*, and in the older botanical books it is *Pinus Larix Rubra*, *P. Pendula*, *P. Macrocarpa*, and *P. Intermedia*; in these old books it is also *Abies Pendula*, and *A. Macrocarpa*. The popular names are Larch, Tamarack, American Larch, Black Larch, Juniper, Espinette Rouge, Red Larch, and Ka-neh-tens ("The leaves fall"), a name given to it by the Indians, for the trees are not evergreen. Hacmatac is, after all, only a variety of Tamarac or Tamarack, a name given to the American Larches, of which there are two species, that already referred to as *Larix Americana*, and another known as *Larix Occidentalis*. Hacmatac is, strictly speaking, the wood of the *Larix Americana*, which is a smaller tree than the *Larix Occidentalis*. Hacmatac grows in Newfoundland and Labrador. It is also found on the eastern shores of Hudson Bay. To the north-west it extends to the Mackenzie River within the Arctic Circle, and to the south by Maine and Minnesota to Pennsylvania. The American larch is a medium-sized tree from 80ft. to 100ft. high, and from 20in. to 30in. in diameter. It grows here in moist uplands; but it is found covering swamps when it is small and of poor quality. The wood is coarse-grained, hard, strong, and fairly durable, even when in contact with the soil, so that it makes good telegraph poles, fencing, and railway sleepers, though it is not much used for any kind of building except shedding and other rough temporary work.

The other Larch, "*Occidentalis*," is found locally abundant, though scattered over Washington and Oregon to Montana. It is also found in British Columbia, south of latitude 53°, and along the eastern slopes of the Cascade Mountains. This Western Larch is rather a large-sized tree, growing from 100ft. to 150ft. high, and from 36in. to 56in. in diameter, some of the largest specimens being found in the Flat Head River Valley, Montana, where this tree appears to attain its greatest development, scattered amongst other conifers, as it is never found forming forests, as other conifers do in certain districts. The wood is resinous, hard, and coarse-grained; it is seldom used for building, and its destination is usually in rail sleepers, posts, or for fuel. The popular names of this Tamarack, are Larch, Red American Larch, Western Tamarack, Western Larch, and Great Western Larch. It weighs about 39lb. to the cubic foot. The London prices for Hacmatac are—3in. by 8in. to 12in., £6 17s. 6d.; 3in. by 7in., £6 10s.; and 3in. by 6in., £6 7s. 6d.

OREGON PINE.

A wood now being gradually taken into use by builders is the bastard hemlock or spruce known as "Oregon," or British Columbia Pine. The tree which furnishes this wood also rejoices in a number of scientific and other names, its correct name, according to the most recent authority, being *Pseudotsuga Taxifolia*; it is also known as *Pseudotsuga Douglasii*, *Pinus Taxifolia*, *Pinus Douglasii*, *Abies Taxifolia*, *Abies Douglasii*, *Abies Mucronata*, *Tsuga Douglasii*, and *Tsuga Lindleyana*. Its common names are Red Fir, Douglas Spruce, Douglas Fir, Yellow Fir, Spruce, Oregon Pine, Red Pine, Puget Sound Pine, Douglas Tree, and Cork-barked Douglas Spruce. It will be seen that the wood is spruce or fir

in popular language and false hemlock in scientific language, for it bears some resemblance to the wood of all these trees. "Oregon Pine" is peculiar to the Pacific region, the *Pseudotsuga* being a genus which consists of a single widely-distributed species found nowhere but to the west of the Rocky Mountains. This tree grows to a fair size in Colorado, even at a height of 10,000ft. above the sea level; it forms extensive forests to the exclusion of all other species in West Oregon and Washington territory, in both of which districts it reaches its greatest development; in latitude it extends from British America to Mexico. "Oregon Pine" is not found in the Coast Archipelago north of Vancouver Island; hence it does not reach the 55° of north latitude. On the margin of its extreme limits north and south the trees do not attain to anything like the size of those grown in the Central Pacific Region. Under favourable circumstances, Oregon Pines grow from 200ft. to 300ft. high, attaining a diameter of from 3ft. to 10ft. and over, in parts of the Rocky Mountains it rarely attains the height of 100ft. Like all other trees, its size is determined within certain limits by the factors of soil, climate, and position with regard to other trees. The wood is hard, strong, and coarse-grained ("red fir"), or fine-grained and more easily worked ("yellow fir"); the colour of the wood is light red or yellow, the latter being the most valuable building timber. Both varieties are from trees of the same species, the difference being due more to the age of the trees than anything else. The sapwood is always easily recognised, as it is nearly white. A great objection to this Oregon Pine is that as it "seasons" it becomes flinty and hard to work, so that it is not fitted for joinery work; but for carpentry and heavy construction of all kinds it is a valuable timber, where much labour is not to be expended on it. One sawn log of this timber, 112ft. long by 24in. square, prime "three crowns," sold by auction in London last May, brought 2s. 1d. per cubic foot. Several other logs were sold, varying from 52ft. to 100ft. long, and from 14in. to 22in. square, at prices varying from 1s. 10d. to 2s. 7½d. per cubic foot, the highest-priced logs being some from 87ft. to 90ft. long, and 18in. to 19in. square, which fetched 138s. per load. The consignment was from Vancouver Island. The ordinary Oregon Pine "lumber" from Port Blakeley, Chemaines, and Puget Sound, consigned and sold as "prime, dry, unsorted," brings the following prices:—4in. by 11in., £12 10s.; 3in. by 15in., 3in. by 14in., and 3in. by 12in., £13; 2in. by 10in. and 11in., £10, all at per Petersburg standard. The same quality, 2in. by 11in. to 16in., 1s. 4d. per cubic foot; 1½in. by 12in. and 1½in. by 11in. 1s. 3d. per foot, 6in. by 12in. from 20ft. to 40ft. long, 1s. 1d. per foot. Small floated logs, from 8in. to 10in. square, and from 50ft. to 52ft. long, 60s. per load; the same sizes, 20ft. to 24ft. long, 51s. per load. The load of timber being 50c.ft., one denomination is easily reduced to the other at a glance. Log timber is usually sold by the "load," and lumber by the Petersburg Standard Hundred or the cubic foot.

SEQUIA.

Sequoia is another endemic genus of the Pacific Coast Region, where it is represented by two species, the *Sequoia Gigantea*, and the *Sequoia Sempervirens*, the first being well known, by reputation at least, as "the biggest tree in the universe." The godfathers of the big tree gave it several names in rapid succession. First, in 1853, it was called "*Wellingtonia Gigantea*"; second, in 1854, it was renamed "*Sequoia Gigantea*"; third, in 1854 again, it received the name "*Taxodium Washingtonianum*"; and the fourth and last name, given in 1855, was "*Sequoia Wellingtoniana*." It now has only one scientific and one popular name, and there is much cause for rejoicing that the number of names a tree may have is in no way proportionate to its size.

The Sequoia is the largest tree in the American forests; it is found along the western slopes of the Sierra Nevada mountains, from America River (Sacramento) in the north to the headwaters of Deer Creek on the south; it occurs in valleys and moist hollows forming isolated grooves, some of the specimens being from 250ft. to 400ft. high, and from 20ft. to 40ft. in diameter. The wood is soft, weak, brittle, and coarse-grained, yet durable in contact with soil; a cubic foot weighs only 18lb. The sapwood is narrow and white, thus contrasting with the heart-

RICA "WHITE"



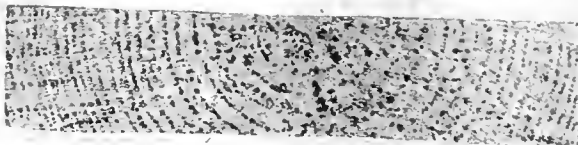
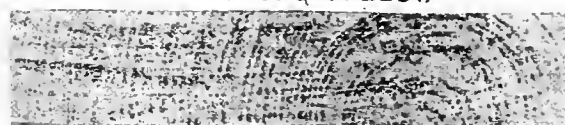
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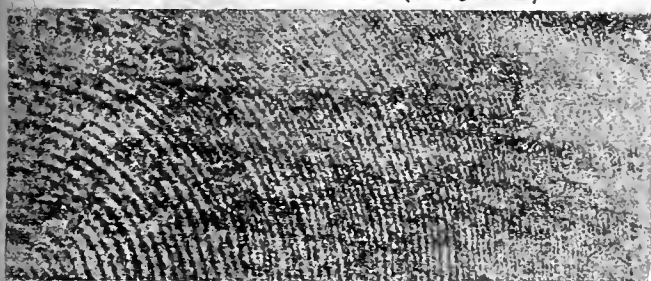
WYBORQ "YELLOW"



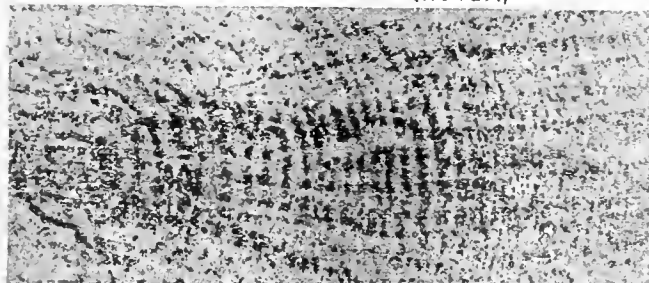
WYBORQ "YELLOW"



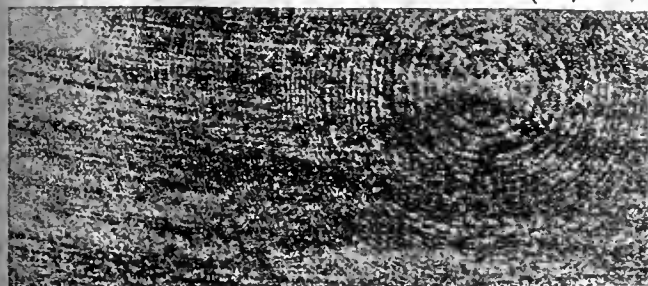
WHITE SEA "YELLOW" (MESANE)



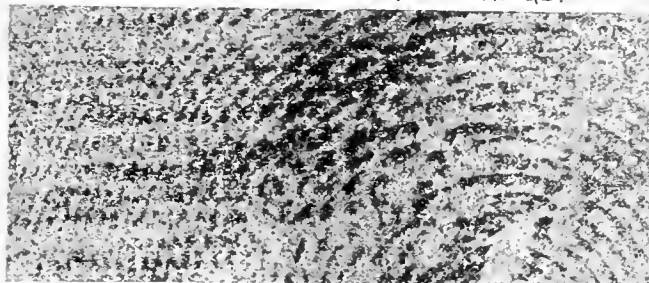
WHITE SEA "YELLOW" (KOVDA)



WHITE SEA "YELLOW" (ARCHANGEL)



WHITE SEA "YELLOW" (APPANAGE)



WHITE SEA "YELLOW" (ARCHANGEL)



WHITE SEA "YELLOW" (ARCHANGEL)



NATURE-PRINTED WOOD SECTIONS.—(SHOWING ANNUAL RINGS).

About Five-eighth Actual Size (Linear Measurement).

wood, which is a clear red that gradually darkens on exposure to light. This Sequoia is not a good building timber for carpentry or joinery. In the States it is converted into lumber, fencing, shingles, &c. Sequoia Sempervirens (syn. Taxodium Sempervirens and Abies Religiosa) is a much smaller tree than the Gigantea: it grows to heights of from 200ft. to 300ft., with diameters of 8ft. and 21ft. respectively. The greatest development is attained in wet situations on the borders of streams, and it gradually dies

out on hillsides and other dry situations. This tree is limited to the coast ranges of California, extending 30 or 40 miles inland from the southern boundary of Oregon (42°) to that between Monterey, and St. Louis Obispo Counties in latitude 36°. This wood is like white cedar, being light, soft, brittle, easily split, and easily worked; the colour is a light red, which turns to a brownish red on exposure; a cube foot weighing 26lb.; the sapwood is easily recognised as it is nearly white. This sequoia is the pre-

vailing architectural timber on the Pacific Coast in California, where it is also used for sleepers, telegraph poles, wine butts, coffins, &c. Report says that this wood with curled or contorted grain is highly ornamental. The writer has used a good deal more of this timber than he will ever use again, and any he has ever seen was either straight-grained or grainless, so that the curly and contorted varieties which take a high polish will have to come along yet, that is, if any trees are left, for the Californian

forests of this wood are being rapidly converted into lumber. Sequoia may be dull-polished with white beeswax dissolved in turpentine, or highly-polished by using ordinary French polish. Clear polish leaves the wood its natural colour. Sequoia may be varnished by first using a filling of white shellac, which should be sandpapered down when dry, after which two coats of good white varnish will give the wood a glossy surface. If each coat of varnish is rubbed down with pumice and oil, and four coats are given, a high polish will result. Sequoia is not likely to become a popular building timber here. It is a dead kind of wood on the bench, and has nothing to recommend it but its colour, which is darker than ordinary pencil cedar. The accompanying sections of Russian and Finnish deals may be compared with those in the last article, showing Oregon Pine and Canadian woods, the latter having a general tendency to run into much coarser grained timber than the former. The twenty-one sections given here will be described fully in an article on the growth of trees in height and diameter.

ACADEMY ARCHITECTURE AND REVIEW.

THE volume which Mr. Alex. Koch has just published in illustration of the architectural drawings at Burlington House is a capital one, including many of the more important exhibits, though we miss several which ought to be included to make this publication really representative of the show as a whole. A second volume will appear towards the end of the year, so that these omissions possibly will be made good. The book includes many rejected contributions from the Academy gathering. All are clearly and well reproduced. About double the space in the volume to that accorded to the Academy Architecture in this way is occupied by works from the Royal Scottish Academy Exhibition at Edinburgh, and from the Institute of the Fine Arts, Glasgow, as well as sculpture from the Royal Academy. Thus considerable variety is insured, greatly to the advantage of the collection of plates, some of which are in colour, giving interiors by foreign architects. The Architectural Review part of the little folio is devoted to photographs and sketches of work from the Continent, ending with a competition design for Cape Town University by the editor. The plans in the volume increase its utility. The advertisements are copious, a few being interspersed between the divisions of the publication, rather spoiling its character. The work has now reached its fifteenth year of publication, and Volume XXIII. Its price is four shillings net in paper covers.

PAINTS, COLOURS, OILS, AND VARNISHES.*

A USEFUL little handbook has just been published by Scott, Greenwood, and Co., 19, Ludgate-hill, under the above title. The author, Mr. John Farnell, manufacturing foreman and lecturer on the manufacture of painters' oils, colours, and varnishes, at the Polytechnic, Regent-street, writes, with a view to give "first-year" students engaged in the study of the manufacture of oils, colours, and varnishes at the various technical classes, an opportunity to grasp the ordinary grade course with a view to their qualifying themselves for prizes and certificates offered by the City and Guilds of London Institute's examination. Mr. Farnell is an old student, and his book will be found of service by those who are deficient in chemical knowledge, without which little progress can be made. The student is required to "read carefully, and do the practical work set forth in these pages," and to write out fully all work done and answer the questions set. For those who wish to occupy the better appointments in laboratories and factories, the volume can be recommended. We can only scan over the sections of the book to show its scope. The first section illustrates and describes the plant required for making lemon and middle chromes. Various pigments are produced by precipitation, and a home-made plant is suggested made out of barrels and pipes, and this is clearly illustrated. Section II describes the weighing up the ingredients for making chromes, such as

bichromate potash, soda crystals, sulphate soda, water, placed in one barrel. Steam is admitted slowly to dissolve the two chemicals. In the next barrel is placed acetate of lead, and water and steam admitted to dissolve it. When cold, the solutions are run out together into another vat, and the chemical action results in chromate of lead or lemon chrome. Other laboratory processes are described and illustrated for other chromes. The mills for grinding the colours are fully illustrated. In like manner the plants necessary for making Chinese, Prussian, and other blue pigments, greens of various kinds, earth pigments like burnt and raw sienna, umber, ochres, &c., brown and black pigments, reds and lakes, white pigments, &c., are fully described. The later sections describe white, painters' oils, adulterants, also deal with turpentine, oil, and spirit varnishes, liquid and enamel paints. The last section gives a series of questions for students who desire to compete for prizes and certificates. These require the student to describe the plant necessary for making various pigments, and the manufacture of the different shades and hues. Some practical questions are given, as how to prepare a paint suitable for a new wood. The work is well illustrated, and its price is 2s. 6d. net.

PRESERVATION OF STEEL IN STRUCTURES.

AN official report on the preservation of structural steel in a late New York building, the Pabst Building in that city, is given in the *Engineering Record*. The steel was exposed during the demolition of the structure, and was under constant examination by engineers of the Department of Buildings. Numerous photographs were taken of different parts. The data furnished have been made the subject of a report by Mr. Jas. P. Whiskeman, Assoc. M. Am. C. E., to Mr. Perez M. Stewart, superintendent of buildings. In the upper stories the steelwork was found in excellent condition. Slight quantities of rust were found, chiefly at connections in the vicinity of the elevator shaft, and where the columns were inclosed with brick instead of being flushed with mortar. In the lower parts of building the corrosion was greater. The building was 108ft. high, 25ft. wide, and 54ft. long. The first story walls were of iron, the second story of limestone, and the upper stories of brick, supported by Z bar columns at each floor. The Roebling system A, type 1, with suspended ceiling, was used for the fire-proof floor arches, and the interior partitions were of expanded metal channels and a patent plaster. The outer walls were furred on the inside with hollow bricks, and the interior columns incased in hollow terracotta blocks. The columns rested on cast-iron bases resting in the rock, others were carried on grillage beams. The steelwork, before leaving the shop, was cleaned of scale rust and dirt, and given one good coat of pure boiled linseed oil, worked into all joints and open spaces. Pins, pin-holes, machined surfaces, were coated with pure whitelead and tallow. The contact surfaces, in riveted work, were specified to be painted before riveting, and two coats of paint were to be given to pieces not accessible after erection. After erection all, excepting the structural work, was to have one coat of paint mixed with pure linseed oil. Grillage beams were to be covered with a coat of liquid asphalt before setting in place, and other structural work was to receive one coat of "Nobrae" before leaving the shops, and after erection an additional coat of the same paint. The work was begun in October, 1898, and finished in about a year, and was constructed in accordance with plans submitted to the department by Henry F. Kilburn, architect. Snowstorms and severe weather were experienced, and delayed the steelwork for some time. In December, 1902, removal of the structural steel was commenced. The expanded metal and channels in the partitions were badly rusted, and the patent plaster seemed to aid the rusting. In the basement floor the ceiling rods had rusted away, and the arch centring was also rusted where exposed. Over the refrigerators in the sub-basement vault the rods holding the ceiling had completely rusted out and the ceiling was ready to fall; the wire cloth had gone, but the concrete floor arches at these points were not affected by the rusting of temporary centring, but remained strong. The boiler stack of 4in. and 6in. sheet steel covered with asbestos, held by galvanised wire mesh imbedded in it, was covered by rust. It was probably painted with a mineral paint which the heat had reduced to dust. The

following examples of corrosion of the structural steel are given, but these are exceptional. The interior beams, girders, and columns above the first floor were, as a rule, free from corrosion, although little patches of rust were found along the outer edges of flanges of beams, probably not well painted, or along the webs of the beams where the paint was scraped off on ramming the concrete. The drying out of the concrete would then cause such rust. But these patches were slight. At the connections of columns and girders the outlines of the angles could be seen in rust. Corrosion was more extensive on the inner side of the webs of the channels forming the elevator framing where unprotected. The wall columns and girders were most affected on the north side, and on the fourth and sixth stories there was more corrosion than above or below, probably due to imperfect coating. Other girder webs were badly rusted, and it is thought that this is probably due to the fact that these rusted points on the web contained the shop-marks and were never painted; but some columns and beams on the first story were in good preservation. The connections were found badly corroded. The cast-iron columns in the basement and vaults were in an excellent state, although the girders next were rusted; but these columns were covered with ordinary lime mortar held to the column by galvanised wire mesh. Other parts of the structure are described in the *Record*, to which we are indebted, and the photographic illustrations help to explain the results. The conclusions to be drawn from these observations are that the preservation of steel depends mainly on the protection afforded by paint, or the encasing of members in concrete or lime mortar, and that steel can resist oxidation when these protective coverings have been thorough; that paint is not always reliable in damp walls; that cast iron withstands rust better than steel. The facts recorded show that the connections of iron and steel are most liable to be attacked by rust, and these should be well painted or covered with a material like cinder concrete. All the unpainted steel-work, tie-rods, hangers, and expanded metal were found rusted more or less, and also the angles and flanges of girders, showing that the paint had in many cases been rubbed off, or had not been coated after fixing. Considerable care and supervision is necessary in seeing that the specified coats are applied. The splice plates of columns are often found to have rusted behind, caused by scraping, or the paint had been rubbed off, so with heads of rivets, which are often rusted before the flanges and webs. These are matters that require very careful inspection. All machined surfaces, pinholes, riveted work should be painted or coated with pure white lead and tallow, and after erection another coat of paint is necessary, or boiled oil should be worked into all joints. As a matter of fact, these finishing operations during erection often leave the steel surfaces bare, and nothing is done in the way of repainting.

CEMENT JOINTS IN DRAINS.

IN his remarks on the above subject, Mr. James D. Armstrong, Prof. Assoc. Surveyors' Institution, gave some useful advice, which we noticed last week in connection with the late conference at Bradford. The quality of the Portland cement is important. The author says: "It should be tested for contraction, expansion, adhesion, disintegration (by boiling for 24 hours after joints have been made for 24 hours). Specific gravity should be about 3.1. Weight per bushel is an unreliable guide—also whether it contains free lime or gypsum; then further for tensile strain, which should not be less than 500lb. per square inch, at seven days. The briquettes being mixed up as stiff as possible, are "thumbed" into the mould. And lastly, but not the less important, its fineness, 80 per cent. of which shall pass through a sieve having 32,400 holes per square inch, and the whole through a sieve of 2,500 holes per square inch." The use of hot lime for foundations is not recommended, on account of expansion. Cement only should be used. The trench excavated is often much too narrow, and the pipes are often laid and jointed without sufficient care;—the inspector is in a hurry, and gives orders to "fill in" before the work is looked at, the trenches are filled up, and the soil rammed down. The consequence of this haste is shaken and broken joints. Can such joints ever hold water? The only cement joint that will stand satisfactorily the water test is this—i.e., the cement

* Student's Handbook of Paints, Colours, Oils, and Varnishes. By JOHN FARNELL. London: Scott, Greenwood, and Co., Ludgate-hill.

should be keyed at both ends, the whole space in the joint being filled in with cement without gaskin or other material, and no sand should be used. The most important point at which the joint should be perfect is between the end of the spigot and the bottom of the socket—a fact overlooked by many engineers, who specify gaskin, &c. When the socket and spigot touch, the surfaces should be unglazed, so as to form a natural "key" for cement. If, from careless stacking in the kilns the ends are glazed, they should be chipped to give a "key" to the cement. The remarks on these and other points are worth noting by all engaged in laying pipes or inspecting the work.

BRICK PAVING IN IOWA.

THE paving brick committee of the Iowa Engineering Society, after two years of painstaking investigation of its special subject, made a report at the annual meeting of the society held at Cedar Rapids in January, 1902, which report, together with the discussion it elicited, has recently been published in pamphlet form. It contains complete and detailed information not only regarding practically every yard of brick pavement in the State of Iowa, but also such allied information as the cost of asphalt, macadam, and other pavements in the cities where brick is used. It was originally proposed that the committee, which is composed of Professor A. Marston, Ames, Ia., chairman, and Messrs. C. R. Allen, C. P. Chase, C. S. Magowan, and Wm. Steyh, should prepare a set of standard specifications for brick paving; but this was not done, it being thought that on account of the variation in local conditions it would be better to present the entire data, and let each engineer draw his own conclusions.

The results of the investigation show how very important brick paving is in Iowa in comparison with other pavements. The cedar block pavements formerly laid in some of the larger cities have in every case proved unsatisfactory, and many of them have already been replaced with brick. Cedar Rapids, in reply to the question as to whether brick had proved satisfactory as compared with other pavements, says: "It is much better than cedar blocks, of which we have had plenty, but not as satisfactory as we would like." Macadam has been laid extensively in some places, due mainly to its cheapness, and occasionally it has been used later as a foundation for brick. At the present time there is also a strong tendency in Iowa to construct asphalt pavements on residence streets, where financial considerations permit, and where well built these pavements have proved satisfactory. Nevertheless, by far the greatest area of paving in the State has been of brick, and brick will probably continue to be the main pavement of Iowa in the future. The returns from 23 cities and towns gave as totals:—4,030,696 square yards of brick pavement, 192,884 square yards of asphalt, and 364,937 square yards of wood-block pavements in the state.

Some of the general results of the investigation may be summarised as follows:—Horseshoe wear on the brick pavements has been found of more consequence than the wear due to wheels. The general opinion seems to be that re-pressed bricks are the best, though some city engineers thought not. There seems to be no marked preference for either end or side-cut bricks; but it is generally considered that round-edged bricks wear better than the square-edged ones. Concrete is considered the best foundation, but this depends much on the location. The majority of the cities prefer a 1½ in. or 2 in. sand cushion for the bricks, although it varies from 1 in. to 5 in. There are so many different recommendations for determining the cross-section of the roadway that it is impossible to draw any general conclusions. An exposure of 6 in. to 8 in. of the face of the curb is recommended, and it is not as a rule considered worth while to point curb-joints with cement mortar. The curbs are generally set on sand. The combined concrete curb and gutter has not been much used in Iowa, but is considered to be very good. Occasionally there was some heaving due to severe cold weather, and in a few cases rumbling of the pavement was noticed at the same time; but as a rule such results were not noticeable. Several engineers recommend a special brick for use along street railway tracks.

In the report of the committee there are given typical cross-sections of the brick pavements in all of the principal cities of Iowa and as much of the information as possible has been compiled into

a table. In that tabular statement the cost of the round untreated cedar block paving in Sioux City is given as 1'33dol. per square yard, there being 213-437 yds. in the city. In Council Bluffs the cost is given as 1'40dol. to 1'59dol., there being 152-500 square yards in that city. The cost of limestone block in Burlington is given as 1'25dol. per square yard, and granite block as 2'75dol.

The committee calls especial attention to the subject of foundations. At the present time, leaving out of account the brick paving successfully constructed upon macadam foundation, there are two kinds of pavements from which selection would usually be made. These are the single course of brick on concrete foundation, and the two-course brick pavements. The two-course pavement was the form first adopted, and will still usually be cheaper to construct than a pavement with a concrete base. The exact difference in cost will vary with local conditions, such as, for example, whether a cheap local brick can be obtained for the under course, and whether materials for concrete are abundant, cheap, and of good quality. The opinion of engineers seems to be usually in favour of the pavement with the concrete base; but where the soil under the pavement furnishes a good, hard, dry foundation, and where the traffic is not too heavy, the two-course pavement has given good satisfaction. Concrete is required wherever there is any doubt as to the character of the soil foundations, and wherever the traffic is excessive. Concrete bases for brick pavements in this state seem universally to be constructed of natural cement in the proportion of 1:2:4, 1:2:5, or 1:2½:5. Mr. E. C. Blake, of Dubuque, raises the question as to whether it would not be better to use Portland cement concrete in a somewhat weaker mixture.

The question of filler is another important subject in connection with brick pavements. A large amount of sand filler is still in use. Most engineers express their preference for a Portland cement filler, but the additional cost is against it. In the few cases in which comparative figures were given, the additional cost of the Portland cement filler seems to range from 4 to 18 cents per square yard. The general proportion for filler seems to be 1:1 or 2:3. The advantages of the cement filler appear to be in providing a support for the edges of the brick, which prevents their chipping, and also in rendering the pavement impervious to water. Its disadvantage, aside from the cost, seems to be the rigidity given to the pavement.

Another important question is the matter of the curbs. The use of stone curb is still very extensive throughout the State. Trouble seems often to be experienced with limestone for curbs, but no complaint has been made of sandstone. However, the use of cement curb is also extensive, and the cost appears to be materially less than that of the stone curb.

Another very important question in connection with brick pavements in Iowa is the extent and causes of failures. Although brick has been used very extensively for ten or twelve years, very little has yet been done to the streets in the way of repairs. This is in spite of the fact that at the time the first pavements were put down the subject was not well understood, and the materials used were not nearly so good as at present. No one can yet predict with certainty what will be the limit of life of brick pavements. Where failures have occurred they can usually be attributed to too soft brick or to poor foundations.

This subject of the injury to pavement from the construction of trenches appears to be the one point with which all places have trouble. Extensive work has been done by Prof. Edw. J. Orton, jun., of the University of Ohio, at Columbus, for the National Brick Manufacturers' Association in connection with the subject of paving brick tests. This association a few years ago recommended specifications for a standard test which has since been known as the N.B.M.A. test. This method of testing was afterwards subjected to considerable criticism, as it did not properly discriminate against the soft brick. Prof. A. N. Talbot, of the University of Illinois, developed and advocated a method of testing in which the charge was composed partially of brick and partially of cast-iron cubes and brick of different sizes and weights. This met the objection to the N.B.M.A. test, and was provisionally adopted in preference to it. Still another form of rattler test was proposed about this time by Mr. Gomer Jones, of Geneva, N.Y., in which

the bricks were to be fastened to the rattler and revolve with it, the charge of cast-iron remaining free in the centre to fall upon and abrade the brick. All these forms of rattler tests were further thoroughly investigated by Professor Orton.

On August 1, 1901, a commission of engineers met the committee of the National Brick Makers' Association, having this matter in hand, to pass upon the results. The commission of engineers included the late Professor J. B. Johnson, of the University of Wisconsin; Professor A. N. Talbot, of the University of Illinois; Professor W. K. Hatt, of Purdue University; and Professor A. Marston, of the Iowa State College. As a result, the committee made, and the National Brick Manufacturers' Committee adopted, a recommendation to the effect that the standard specifications for rattler tests of paving brick should be the so-called Talbot test, in which the charge is composed partially of paving brick and partially of cast iron. The paving brick committee of the Iowa Engineering Society adopts these specifications, and recommends, regarding the allowable limits of rattler losses for good paving brick, that until more data are secured, a maximum allowable loss of 25 per cent. would be reasonable.

No amount of testing can, however, do away with the necessity for a close inspection of every load of brick used on the work.

A BOOK OF COUNTRY HOUSES.*

THE volume which Mr. Batsford has just published, giving a folio of plans and views of houses built from the designs of Mr. Ernest Newton during the past ten or twelve years, recalls several examples which we have seen elsewhere, and it can hardly be said that any of the houses chosen for illustration present any specialised novelty or individuality of treatment, though no doubt they illustrate much that is common to the better class of moderately-sized English modern houses designed by architects whose names have been associated with this style of building. The plans are given to a good scale, and the most successful of the plates are those reproduced from photographs. The author does not wish his book to be thought a collection of specimens, and, above all, not to be taken as a volume of examples to be copied by others. The sale of such publications, however, largely depends upon their being used as pattern books, and the idea of securing clients is covered by the neatly expressed hope that the houses thus put forward may be found suggestive perhaps not so much to brother architects as to the house-building public. Books of this scope too have appeared from time to time with more or less success for very many years, and it remains to be said that Mr. Newton's nicely got up folio is quite as good as any that have gone before. He is free of the Art and Crafty tricks in house building, which he calls "Freak Architecture," breaking away as it does, in the chase after originality, from the normal lines of natural development which naturally comes about by using materials in a reasonable and appropriate fashion without attempting to ignore their idiosyncrasies. The perfunctory enthusiasm of the "New Art" finds little sympathy with Mr. Newton, though he uses these words somewhat tenderly, in respect to the extravagances of the school to which he himself belonged years ago. It was a school, however, which originated with a genuine desire to mend matters in domestic buildings, and, thanks to the lead of Nesfield and Norman Shaw, did reform the whole system of house planning in England with the utmost advantage, though there still remains a vast degree of improvement to realise. Mr. Newton urges the use of local materials, and generally his designs appear to be done in brick and tile. Some are in roughcast, and one or two in stone. We doubt the beauty of diapered mural chessboards, square and diagonal, as in type of house No. 8. Numbering the samples in this way emphasises the idea which the author says he does not mean. Some of the interiors are rather good, the best being perhaps the staircase of house No. 8, with its simple inlay and moulded balusters. We much prefer it to the more ambitious work shown in specimen house No. 9, which externally has a Georgian look with big plain chimneys. This book calls for little comment really, and to criticise the plans would serve no good purpose. The kitchens are generally well isolated, and there

* A Book of Country Houses (sixty-two plates of nineteen houses). By ERNEST NEWTON. London: E. T. Batsford. Imp. quarto. Bound, 21s. net.

is in most cases a good hall and a commodious stairway, plenty of bay windows, and the fireplaces are well placed in respect to the doors and windows of the rooms in which they are situate. The book is well produced, and will doubtless find a ready market.

WATERWORKS ENGINEERS IN CONFERENCE.

THE members of the British Association of Waterworks Engineers are holding their annual conference in Bolton during this week. There are meetings each morning for the discussion of more or less technical subjects, and the afternoons are being spent in visiting the more interesting works of the neighbourhood. The conference was opened on Tuesday morning in the council chamber of the town-hall, when the Mayor of Bolton (Mr. Alderman Miles) gave the delegates a hearty official welcome. The president for the year is Mr. R. H. Swindlehurst, the engineer of the Bolton waterworks.

Mr. Swindlehurst, in his presidential address, spoke of the growth of the Association, which now contains 286 members, or 24 more than in the previous year. The great value of the Association lay in the opportunity it gave, through the reading and discussion of papers, of the interchange of knowledge and ideas on points of practice. The duties of the waterworks engineer, if carried out aright, had a most important bearing upon the improvement of the health and prosperity of the people. Statistics showed clearly that the expenditure on the improvement of the water supply in the larger towns had resulted in a saving to the community, and no one could fully estimate the benefits conferred on our crowded centres of population by the introduction of a pure and abundant water supply. In spite of this, the difficulties and opposition met with when such schemes were mooted were often very serious, and the public needed to be shown that money expended on the improvement of the water supply was a good investment, and that it was to their own interest that the works should be of the best and most perfect description. Going on to deal with questions affecting variations of the rainfall in different districts and methods of filtration, he said that of course the purity of a water supply was a matter of the highest importance. Although it was true that waterworks engineers succeeded in making good and effective filter-beds long before they knew anything at all about microbes, it must be admitted that recent researches in the domain of the bacteriologist had helped the engineer to a better and more thorough knowledge of what he was about, and had emphasised in a remarkable manner the necessity of filtration being carried out in an intelligent, systematic, and scientific manner.

Mr. Swindlehurst was thanked for his address. Afterwards Professor S. Delcigne, of the Owens College, read a paper on "Protection of Gathering Grounds and Filtration Compared." He reviewed in detail the evidence in support of both methods, and arrived at the following conclusions:—That filtration of unpolluted water is unnecessary as a protection against disease, and in the case of polluted water is not always an absolute safeguard. To make filtration efficient, both constant skilled supervision and considerable expenditure are necessary. Protection against pollution is a sufficient safeguard against disease, and the initial expenditure is not unusually very large. The supervision of depopulated gathering grounds requires no special skill or large permanent expenditure. "When expense is not a matter for consideration, the best results are obtained by a combination of protection with well-conducted filtration; but whenever expenditure makes it a matter of necessity to choose between filtration and protection, I have no hesitation in saying that protection is better than filtration, which is really equivalent to saying that prevention is better than cure."

In the discussion which followed, several members argued in favour of filtration as against the acquisition and protection of watersheds.

The meetings were resumed, at the town hall, Bolton, on Wednesday, the President, Mr. R. H. Swindlehurst, occupying the chair. The final report of the committee appointed to consider the question of the standardisation of cast-iron pipes recommended in order to secure the universal adoption of any given standard, that it would be desirable to limit the number of sizes standardised to those in common use in this country, and the

number of classes for each size to be three or less. They did not consider that the metric system of measurement could be conveniently adopted at the present time in place of the existing standards. In the opinion of the committee the next step to be taken was to refer the whole matter, including their own suggestions, to the engineering standards committee. The report was adopted. "The Raising of Water from Deep Wells and Borings by Compressed Air" was the title of a paper contributed by Mr. W. H. Maxwell, of Tunbridge Wells. In 1900 Mr. Maxwell installed an air-lift pumping apparatus at the Tunbridge Wells Waterworks, and the plant has since been in constant use. Referring to the cost of the scheme, the paper stated that during the earlier months of this year, with water levels varying between the depths of 98ft. and 118ft. below the surface, under regular working conditions, the full cost came out at a fraction under one penny per 1,000 gallons raised. Mr. Hodson (Loughborough) said that the fact that 80 per cent. more water was raised than by any other system was a great advantage in favour of the compressed-air plant. The secretary (Mr. Griffith) said the whole matter was in a condition which attracted great interest, but fuller and more careful experiment in the matter was absolutely necessary. A vote of thanks was accorded the author of the paper. In the afternoon the members visited the local waterworks, and in the evening the annual dinner was held.

THE CAMPANILE OF ST. MARK—DISCONCERTING DISCLOSURES.

IT is one thing, writes the Venice correspondent of the *Scotsman*, to say that the state of the foundations of the campanile of St. Mark's Church had nothing to do with its fall; it is another thing to say that their state is such that a new campanile may safely be built upon them. The first of these statements has been made over and over again on the authority of the engineers in charge of the works, of the Royal Commission appointed to report upon its fall, and on the authority of the present writer, who saw with his own eyes the causes at work that brought about the fall, and saw the foundations after the fall to be exactly what they were before it. That statement therefore stands incontrovertible. The second statement one naturally feels inclined to make as an inference from the first. If the foundations have not been affected, why not build upon them? If they carried the weight of the old campanile, they can carry the weight of the new. Reasoning in that way the second statement was also made, and asserted on the authority of those in charge, and as an observer's own personal opinion. That the old foundations were considered fit to bear the new campanile, and that the intention of all concerned was to build the new campanile on them, is proved by the fact that the first stone of the new campanile was actually laid upon them by the Count of Turin on St. Mark's Day, April 25.

Now, however, it turns out that the data on which the second statement was grounded were altogether insufficient. The foundations that seemed to justify it were the few courses of large, well-dressed, and well-placed stones that were visible above the level of the pavement of the Piazza of St. Mark. But what of the foundations lower down? What of the building that goes down from the level of the Piazza to the oak platform on the top of the piles, a distance of 12ft.? That was never thought of, apparently. Now, however, a trench 12ft. deep and 9ft. broad has been cut round and round the campanile—that is to say, the foundations are now laid bare from top to bottom, and the sight is not a little surprising. To-day, July 18, I have had the opportunity of carefully examining them. The courses of stones below are not like those above—they are composed of smaller stones and of unhewn stones. Not only so, but they are not too carefully laid. Further, the lower they are the worse they are. Indeed, when they were laid they had not the means of keeping the water out, and so they were thrown down, apparently, in hot haste. The lower row, that resting on the oak platform, is very irregular. At the north-west angle there is an enormous stone, but it is in form like a right-angled triangle, and, strangely enough, its acute angles are turned inwards, so that the weight of the building inside has pushed it outward. Then,

again, all the stones are Istrian sandstone, and, therefore, liable to absorb water and to disintegrate. Again, when the foundations were laid they had not cement, they had not hydraulic lime, and so the lime used was simply common lime mixed with sea sand. The result is that the salt water has percolated through and through all the foundations of the campanile, below the level of high-water mark, which is the level of the Piazza, and has disintegrated the mortar and washed it out. As the tide falls in the lagoons, the water trickles all through amongst the foundation-stones, running in little streams in places. Again, the foundations of the campanile have a list towards the Doge's Palace. This, at the level of the pavement of the Piazza, is nine centimetres, or 3½ in., which is not much; but as the tower ascends, it would amount to a great deal. Once more, hydraulic lime will not attach itself to ordinary mortar. There would be difficulty in uniting the old with the new. Lastly, the foundations are split from top to bottom where the door of the campanile was. Of the piles and platforms no one can speak with absolute certainty. The ends of the oak platforms which I saw seemed in good condition, but they were covered with mud, and water was trickling all over them. The piles, which are of poplar, are not long—6ft. only—and, so far as they have been seen, are in good condition; but one cannot judge the state of the whole from the state of two or three. The result is that a serious difficulty has arisen. Engineers, and architects, and builders too, think it madness to rebuild on such foundations. They have done their work for a thousand years, and now fresh foundations are wanted. But all was arranged. The cost of reconstruction calculated; Government Bill passed arranging subsidy; the first stone of new campanile laid by Royalty; and now all has to be redone. The cost of dismantling and rebuilding the foundations will not be less than quarter of a million pounds sterling.

CHIPS.

In the case of the application on behalf of Walter Ford (described in the Receiving Order as W. Ford), Hollybush-street, Barking-road, Plaistow, E., builder, the order of discharge has been suspended for two years ending June 18, 1905. A similar order of suspension for two years has been made in the case of Eliezer Howson, Lincoln, builder and contractor.

The mining village of Skelmersdale, a few miles from Liverpool, has been without a church for about five years, the one that was erected in the 18th century having become dangerous, owing to colliery operations. Earl Latham, who is Provincial Grand Master of West Lancashire, on Monday laid the foundation-stone of the new church on a site adjoining that of the old one, with full Masonic ceremony.

The burgh council of Oban have resolved to instruct Messrs. D. and C. Stevenson, C.E., of Edinburgh, to prepare working plans and specifications for the works connected with a new intercepting sewer.

On Sunday the Very Rev. Canon Crawley, V.F., of Sale, laid the memorial stone of a new infants' day-school in connection with St. Edward's Catholic Schools, Runcorn. The new school, which is in course of erection from the designs of Mr. Edmund Kirby, of Liverpool, will provide accommodation for 130 children, and the total cost will be about £2,000.

The St. Marylebone Guardians were informed at their last meeting that the infirmary committee had obtained a report from Mr. A. Saxon Snell, F.R.I.B.A., on the drainage at the workhouse infirmary. He advised the relaying of the whole of the external drainage, which was found to be in a very leaky and defective condition, with metallic pipes. It is estimated to cost about £5,000. After discussion it was decided that Mr. Saxon Snell should carry the work through.

A return issued by the London County Council shows the addition to labouring-class accommodation provided in 1902. The total estimated number of persons provided for has been 72,140, of whom 33,418 were in districts north of the Thames, and 33,722 in districts south of the river. The estimated net increase of persons for whom accommodation has been found is 65,671, of whom 31,911 were north of the Thames, and 30,760 on the south.

Plans prepared by Mr. Humphries for the drainage of Hungerford have been approved by the urban district council. The scheme provides for the treatment of the sewage in septic tanks and bacteriological beds, the effluent to be passed over land. The total cost is estimated at £8,166.

BOOKS RECEIVED.

Holidays in Eastern Counties is the title of the latest handbook issued by the Great Eastern Railway Company, whose enterprise in making known the rural beauties and historic associations of the extensive district they serve deserves the reward it is gaining in an ever-increasing influx of tourists and holiday-makers. The little book is brightly written by Percy Lindley, very fully illustrated, and gives prominence to some of the less known districts in East Anglia. A useful feature is a list of the golf-links in the Eastern Counties. An agreeable feature of the work is the freedom from more or less artfully concealed advertisements.

CHIPS.

Mr. R. H. Becknell, an inspector under the Local Government Board, has held an inquiry at Scalby into an application of the urban district council to borrow £5,183 for works of sewerage.

A stained-glass window has been placed in St. Giles's Parish Church, Willenhall, in memory of Mrs. Mary A. Gough. The design represents "The Adoration."

Dunnottar Parish Church, Stonehaven, N.B., has been recently reopened for public worship after having been almost entirely reconstructed from the designs of Mr. G. P. K. Young, A.R.I.B.A., Perth.

Messrs. Graham, Morton and Co., Ltd. are building a large complete new engineering works in Hunslet, Leeds. The works comprise three large bays 50ft. span over 400ft. long, together with engine and boiler-house, &c., and other outside buildings.

Colonel W. R. Stacke recently held an inquiry at the town-hall, Great Yarmouth, on behalf of the Local Government Board into the application of the Town Council for a loan of £825 on account of underground conveniences to be erected on Hall Plain, and £550 for widening High-street, Southtown.

The town of Radcliffe, near Bury, Lancs, has just been presented with a convalescent hospital. It is the gift of Mr. Adam Crompton Bealey, a manufacturer of the town. The building and furnishing of the Bealey Memorial Convalescent Hospital have cost £7,000, and the endowment is about £21,000.

A new organ, built and erected in the Otley Parish Church by Messrs. Abbott and Smith, of Leeds, at a cost of over £1,100, was dedicated on Tuesday by the Bishop of Beverley.

The city corporation of Manchester are about to widen the streets around the infirmary. In Piccadilly the pavement will be carried back opposite to the Queen Victoria memorial statue, and also opposite to the Peel and Wellington statues. This will give a straight line of thoroughfare along Piccadilly, making the whole roadway 56½ yards wide at the Market-street end, and 47½ yards wide at the London-road end. There will be a considerable widening of Portland-street and George-street. The scheme will provide needed room for working the city tramway service, which is still growing.

Under the title of Ingram Houses, Limited, a company has been formed under the auspices of the Bishop of Stepney for building lodgings for clerks employed in city offices and warehouses. A freehold site has been bought at Stockwell for £11,500. The proposal was to erect on this site a building which would cost £40,500. This cost has now been reduced to £30,000; and the building will be capable of giving 200 young men and lads a private room and the share of large common rooms for food and recreation.

The Dean of Hereford has issued an appeal for £5,000 towards the rebuilding of the west front of the nave of Hereford Cathedral, after designs by Mr. J. Oldrid Scott, F.S.A., and states that a further sum of £5,000 will be required later on for the front of the side aisles.

A new reredos has recently been placed in the Lady-chapel of the church of St. Petroc Minor, Cornwall, as a memorial to the Rev. Hildebrand Barker, late rector of the parish. It has been designed with the altar by Mr. J. N. Comper on strictly English lines. Four pillars, with eight burning torches, stand at the four horns of the altar supporting side curtains of silk; there is no gradine, as in most Continental churches, but the two candlesticks stand directly on the table. The reredos, which is coloured and gilt, contains figures of the Blessed Virgin and SS. John the Evangelist, Petroc, Francis of Assisi, and Antony of Padua.

A memorial is to be erected on a public site at Berwick by Sir Hubert Jerningham, ex-Governor of Trinidad, in memory of his wife, Lady Jerningham. Mr. Ingram is to be the sculptor. The work will take the form of a recumbent figure in marble of Lady Jerningham with a bound on each side, and a drinking trough will be placed in front in further recognition of her love for dumb animals.

OBITUARY.

Mr. JAMES ABBOTT McNEILL WHISTLER, the erratic impressionist etcher and portrait painter, who died on Friday at Cheyne-walk in his sixty-ninth year, will be longest remembered for his success in the gentle art of making enemies, which he so assiduously practised. His overweening vanity induced a super-sensitiveness, which resulted in his bringing the well-remembered libel action against Ruskin, when a too-sympathetic jury awarded excessive damages in the form of one farthing. His reign as President of the Society of British Artists was brilliant but brief, and he was succeeded by an artist of more solid qualities in Sir Wyke Bayliss. Whistler's best portraits were undoubtedly those of his mother, now hung in the Luxembourg, and of Carlyle, for which the Glasgow Corporation, with many regrets, parted with £2,000, and secured thereby a cheap bargain. Architects will recollect that in 1888 Whistler married the widow of E. W. Godwin, an equally erratic and brilliant draughtsman, talker, and writer. Mrs. Whistler, who died five years ago, and was the daughter of J. B. Philip, the sculptor, left no issue by either marriage.

With great regret we announce the death of the senior partner in the well-known firm of Archibald Smith and Stevens, of Janus Works, Queen's-road, Battersea, Mr. J. S. STEVENS, of Poundfield, Old Woking, on the 15th inst. No changes arise in connection with the business, which will be conducted as heretofore by the surviving partners.

Mr. BENJAMIN EBENEZER NIGHTINGALE, the well-known builder and contractor, of Albert Works, Albert Embankment, S.E., died, we regret to hear, after an illness of some months' duration, on Friday in last week, the 17th inst., at Richmond, Surrey, aged sixty-six years, and was buried at Norwood Cemetery on Wednesday. Mr. Nightingale, whose portrait was given in our issue of June 13, 1896, had been in business in Lambeth for eight-and-forty years, and for the last 47 years at Albert Works. Among his principal works were the New Council Chamber, Guildhall, and Leadenhall Market, both from the designs of the late Sir Horace Jones; St. Olave's Rectory, S.E., the latter from the designs of the late Ewan Christian; monasteries and a church planned by the late John F. Bentley; new board offices at the Stationers' Hall, under Mr. Robert Milne; the chapel at the Consumptive Hospital, Brompton; Centenary Hall at the Royal Masonic Institute for Girls, Battersea Rise; St. George's and St. Giles's Workhouse, Bloomsbury; the Birkbeck Literary Institution, and Messrs. Burt's printing premises adjoining; Homerton Workhouse Infirmary; additions to Leavesden Asylum, for the Metropolitan Asylums Board; numerous churches, including St. George's, Catford; Emmanuel, Harrow-road; St. Andrew's, Streatham Common; St. Peter's, Limehouse; All Souls', Harlesden; and a Baptist chapel at Hendon; and many London Board schools and police-stations, warehouses and banks, and other works from the plans of Sir John Taylor, Mr. Aston Webb, R.A., the late Mr. E. B. T'Anson, the late Mr. Ebenezer Gregg, Mr. R. Fabian Russell, and other architects. Mr. Nightingale served some years since as President of the Master Builders' Benevolent Institution; he had been a member of the London Master Builders' Association since its foundation, he was a prominent member of the Bricklayers' and Tilers' Guild, and of the National Liberal Club. The business of the deceased is being carried on by his sons, who have for years taken an active share in the management.

The Buile Hill estate at Pendleton, which was acquired by the Salford Corporation some time ago for the purpose of a park, was opened to the public on Wednesday.

Messrs. Wm. Potts and Sons, clock manufacturers, of Leeds, have just completed a new illuminated turret clock at the Victoria Mansions, Hull, for Sir W. A. Gelder and Mr. Kitchen, architects, Hull, and another at Messrs. Powolny's new restaurant, Hull, for Messrs. A. Neill and Son, architects, Leeds, and are erecting a new memorial clock at Elton Church, Hull, to the memory of the late Colonel Grimston, J.P., High Hall, Elton, W. Hull. Messrs. Potts are also erecting a large clock with four illuminated dials and bell at Potternewton, Leeds, and illuminated clock with two dials at Chapel Allerton, Leeds, and clock and bell for West Shrewsbury, Salop.

PROFESSIONAL AND TRADE SOCIETIES.

DEVONSHIRE CHURCHES AND SCREENS.—The annual meeting of the Devonshire Association was held at Sidmouth on Friday, when a paper on Devonshire church screens was read by Mr. F. Bligh Bond, F.R.I.B.A., Bristol. Mr. Bond dealt with the churches alphabetically, giving a short account of the screen work remaining in each church, and briefly describing the nature of the work and the character of the detail. There were 185 parishes in the county that still retained work of this class, some churches having more than one screen, the total number being between two and three hundred. The tide had set in somewhat strongly in favour of the restoration of these ancient marks or divisions, and Mr. Bond expressed his regret that in the restoration work the style known as "the new art" was being adopted, having regard more to immediate effect than truth to historical detail or harmony of surroundings. This departure he attributed to the effect of the teaching, without restraint, of the schools of art. He classified his screens according to their types, so far as he could do so, and detailed the treatment of the different screens.—Mr. E. Harbottle Reed, diocesan architect, of Exeter, described "A Doomed Exeter Church," that of Allhallows', Goldsmith-street. Under the Exeter Corporation Act, 1900, powers were granted for the removal of the church and for the appropriation of the site, or some part of it, for street improvement. Goldsmith-street, adjoining the church, was by its presence so contracted as to be at times dangerous to traffic, and which for greater convenience of access to the market it was desired to widen. The church was also stated to be unnecessary, owing to a great diminution in the number of residents in the parish. Mr. Reed traced the history of the church since 1584, and remarked that structurally the building was now in good repair. It had a modern front and small organ (in an ugly case); it was completely seated and complete in its fittings, receiving every care at the hands of the rector, who would no doubt keenly feel the proposed undoing of his fourteen years' labour in raising the funds absorbed by the renovation work. He recorded his thanks to Mr. Hope for the exceedingly courteous manner in which he had assisted in his investigations. In June of the present year a portion of Mr. Brooking's premises in Gandy-street, in the vicinity of the church, was pulled down to make way for new extensions, involving the demolition of an old wall about 3ft. in thickness. This revealed a quantity of ancient carved stones which had simply been utilised for walling purposes. Unfortunately, in effecting their removal, pickaxes damaged the foliage considerably, but sufficient was left to give some answer to the repeated question, "What has become of the Mediaeval buildings of Exeter?" By the courtesy of Messrs. J. Pinn and Sons, the architects for the extension works at Messrs. Brooking's, photographs had been taken of this curious medley of ancient stonework. Stones 1 and 2 are Norman scalloped capitals of tufa, and might possibly have been brought from St. Nicholas Priory, as they were about the date of that foundation, 1809. Nos. 3 and 4 are arch voussoirs very cleverly cut, of the Transitional period, and are of Salcombe stone. No. 5 is a Salcombe stone capital, Early English. It shows signs of old decoration. No. 6 is a nook shaft capital of Early English form, denuded of foliage; but the bell is richly coloured with vermillion and gilded. No. 7 is a Beestone nook shaft capital of Decorated date, and No. 8 is a portion of Late Perpendicular panelling. Upon the demolition of Allhallows Church the plate and registers would be deposited in St. Paul's Church.

NATIONAL BUILDERS' FEDERATION.—The half-yearly meetings of the National Federation of Building Trade Employers of Great Britain and Ireland began at Cardiff on Tuesday. About 150 delegates attended, and they were officially welcomed by the mayor at the South Wales Institute of Engineers, Park-place. Amongst those present was Mr. James Allen (president of the Cardiff branch of the federation). The mayor said that the crowded state of our cities was becoming a serious problem for solution by public authorities and public men. Having regard to the fact that so much was being said as to the value of good houses, particularly for the working classes, as a factor in the improvement of their social conditions, he considered that if it was part of the mission of the Building Federation to solve this question, they would set up a claim to

be in a sense pioneers of civilisation. Subsequently there was a meeting of the council. After lunch at the Royal Hotel (Mr. Allen presiding), the delegates proceeded to Cathays Park to inspect the new municipal buildings in course of construction. In the evening a banquet was held at the Royal Hotel.

NEWCASTLE ARCHITECTURAL AND ARCHEOLOGICAL SOCIETY.—The members will hold a third meeting of this year to-day (Friday) in Yorkshire. The members leaving Newcastle by the 9.30 train will pick up their colleagues en route and alight at Melmerby Station. They will drive to Wath and inspect the church containing the brasses of the Nortons of Norton Conyers (1420), the fine oaken chest, and other objects of interest. From thence they will visit Tanfield Church. The north aisle of this church (rebuilt in 1343) contains the monuments of the Marmions, the most important one being of alabaster with effigies of Sir Robert de Marnion and his wife. The gateway tower of Lord Marmion's Castle is quite near to the church; it has a fine oriel window, and the old bastion still is standing. They will drive next to Purneston Church, which was built about the year 1375. The spire surmounting the west tower of this church has shields containing arms on the four pinnacles. A visit to the quaint old almshouses (1680) in the village will be paid. From Burnstun the party will drive via Watling-street to the Late Decorated church at Kirklington, the south aisle of which was formerly a chapel of the Wandesfords. This is now inclosed by a screen of flowering tracery, and contains a brass dated 1463 and very fine effigies of John Wandesford and his wife, with one of Sir Christopher Wandesford. Kirklington Hall (1571), the property of the Wandesford family, will be visited next. The hall is famous for the secret passage which leads from it, and which can be followed for some thirty yards. The drive will be continued to Thirsk for dinner.

ROYAL ARCHEOLOGICAL INSTITUTE.—The annual meeting of this society was opened at York on Tuesday. The reception was given in the ancient Guildhall by the Lord Mayor, who referred to the fact that their last visit to York was so far back as 1846. The company adjourned to the Council Chamber, where Sir George J. Armitage delivered his presidential address. The afternoon was spent in an inspection of York Minster, St. William's College, and the treasurer's house. St. William's College was founded in 1453 as a college for the parsons and chantry priests of the cathedral to reside in. It stands at the east end of the Minster, and has lately been purchased by Convocation and the House of Laymen of the Northern Province, and it is intended to convert it into a church-house. The week's programme includes visits to various parts of the county and to a number of historical castles.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The preliminary midsummer examination, qualifying for registration as Probationer R.I.B.A., was held in London and various provincial centres on the 9th and 10th of June. One hundred and ninety-eight candidates were admitted, and claims for exemption from sitting for the examination were allowed to the number of 35. The remaining 163 candidates were examined, with the result that 117 passed, and 46 were relegated to their studies. The passed candidates, with those exempted—numbering altogether 152—have been registered as probationers. The intermediate examination, qualifying for registration as Student R.I.B.A., was held in London and four provincial centres on the 9th, 10th, 11th, and 12th June. One hundred and nineteen candidates were examined, of whom 50 only passed, the remaining 69 being relegated to their studies. Of the passed candidates, who all have been registered students, the three first given in order of merit as placed by the board of examiners are:—James Theodore Halliday, 1, Barlow-street, Oldham; James Reid, Beechwood-terrace, Palmarnock, Glasgow; and J. Hatton Markham, 23, Primrose Hill-road, N.W. The final and special examinations, qualifying for candidature as Associate R.I.B.A., were held in London from June 26 to July 3. Of the 55 candidates examined, 22 passed, and the remaining 33 were relegated to their studies. The successful candidates are as follows:—Edward Percy Archer, Etchingham Park-road, Church End, Finchley, N.; Ormrod Maxwell Ayrton [special examination], 28, Theobald's-road, W.C.; Henry Arthur Battley, Engineer's Office, L.B. & S.C. Railway, London Bridge, S.E.; Thomas James Bee, Heath View, Sidcup; Harry Thomas Bill,

6, Cherry-street, Birmingham; Herbert Black, Sussex House, Kensington Park-road, Notting Hill, W.; and William Alfred Thomas Carter, 66, Richmond-road, Bayswater, W. The number of failures in each subject of the final examination was as follows:—I. Design, 22; II. Mouldings and Ornament, 25; III. Building Materials, 13; IV. Principles of Hygiene, 14; V. Specifications, 11; VI. Construction, foundations, &c., 12; and VII. Construction, iron and steel, 13.

CHIPS.

Beckingham church tower, near Gainsborough, is about to be enriched by having a large chiming clock erected upon it. It will have two 6ft. dials, facing south and east. It will chime the quarters upon two bells, and strike the hours upon the largest bell. The work is being carried out, to the designs of Lord Grimthorpe, by Messrs. John Smith and Sons, Midland Clock Works, Derby.

At Buckingham Palace on Saturday the King formally conferred the honour of knighthood on Mr. William Alfred Gelder, F.R.I.B.A., the Mayor of Hull, and invested Mr. Henry Tanner, F.R.I.B.A., principal architect in H.M. Office of Works, and Mr. Robert Cochrane, F.R.I.B.A., of the Irish Board of Works, Dublin, with the Companionship of the Imperial Service Order.

At the Manchester Consistory-court, on Friday, the Chancellor granted faculties for the following alterations in churches:—Worsthorne, near Burnley, to remove the west gallery and two disused vestries; Stowell Memorial Church, Salford, improvement and completion of the pulpit and other alterations; St. Ann's, Clifton, to erect a plain oak reredos behind the communion table, and to enlarge the organ, and make alteration for an installation of incandescent lighting; St. Peter and Paul, Rishton, for the erection of a stained-glass memorial window in the north aisle; and St. Michael's, Croston, to substitute stained glass for the present plain glass in the three-light window on the south side of the chancel.

The Honorary Professorship of Forestry at the Royal Agricultural College, Cirencester, vacant by the death of Sir Henry Gilbert, F.R.S., has been filled by the appointment of Dr. W. Schlich, C.I.E., F.R.S., late Inspector-General of Forests, Government of India, and Principal Professor of Forestry, Cooper's-hill.

Princess Henry of Battenberg on Saturday afternoon laid the foundation-stone of the new chapel of the Royal Naval School, Eltham, henceforth to be known simply as Eltham College. The chapel, which replaces an iron building, will cost £3,000.

The statue of Queen Victoria, which will be unveiled by Princess Henry of Battenberg on Tuesday next, has now been erected in the gardens of the new Municipal Buildings at Scarborough.

The work in connection with the water supply which Lord Alverstone has provided for the village of Alverstone is practically completed. A reservoir, 80ft. by 60ft., with a capacity for 300,000 gallons, is being constructed on the top of Queenbow, and the source of supply is from the hills and near Apse Reach, where there is an abundance of water.

The gas committee of the Halifax Corporation have appointed Mr. J. Wilkinson, of the Grimes-thorpe Gas and Chemical Works of the Sheffield Gas Company, manager of the Halifax Corporation Gas-works, at a salary of £500 per annum, in succession to Mr. Thomas Holgate, resigned.

Mr. R. H. Bicknell, Local Government Board inspector, held an unopposed inquiry at Goole on Friday regarding an application by the urban council for sanction to borrow sums of £2,800 and £870 for the gas and water undertakings respectively.

The tramways at Reading, which have been converted from horse to electric traction for the corporation, were formally opened on Wednesday.

A bust of the late Sir William Henry Flower, F.R.S., Director of the Natural History Departments of the British Museum, the work of Mr. Brock, R.A., will be formally presented to the trustees of the British Museum by the "Flower Memorial Committee" to-morrow (Saturday). The Archbishop of Canterbury will receive and unveil the bust. The ceremony will take place in the central hall of the Natural History Museum at a quarter past one p.m.

The new trolley tunnel under the North River at New York City will have one of its twin tubes completed and ready for operation early next summer. This tunnel is the old Hudson River Tunnel, whose partly completed bores are being finished. According to the statements published, there remains only 1,200ft. more of the north tube to be completed, and work is progressing at the rate of from 3ft. to 13ft. per day. The south tube has not been commenced. This is to be 5,100ft. long.

Building Intelligence.

BIRMINGHAM.—The new crematorium for Birmingham, at Sheldon Coppice, near Rocky-lane, on the Birmingham and Walsall-road, at Perry Barr, is rapidly approaching completion, and in September will be opened by Sir Henry Thompson. Mr. Frank B. Osborn, of Birmingham, is the architect. The chapel and crematorium stand in the centre of the land, and are approached through an entrance gateway and drive from the main road, at which there is a lodge. At the entrance to the chapel there is a large vestibule. The size of the chapel itself is 50ft. by 25ft., and about 40ft. high to the ridge, with an open-timbered roof, the total length of the building being about 107ft. On one side there is a vestry and registry office with a separate entrance, and on the other side a small mortuary chamber. The chapel is principally lighted by lofty clerestory windows, and underneath these on both sides are recesses for the reception of urns containing the ashes of the dead. If relatives prefer, these urns may be placed in cloisters of ornamental design, which they will be at liberty to erect in the grounds. The chapel, which is of an ecclesiastical character, in brick and red stone, with tiled roof, will be provided with chairs and furnished with a reading-desk and harmonium. The draped catafalque will be against the end wall opposite the entrance, and is to stand on a stone platform approached by two steps. Immediately behind the catafalque, and concealed by curtains, is an iron door leading to an intermediary chamber. On the north-west side is a tower, 80ft. in height, containing the stack. The coffin, when brought into the chapel, is placed upon a catafalque. When the committal sentence in the religious service is reached, the coffin passes noiselessly, by means of an invisible mechanical arrangement, into the intermediate chamber, and finally into the incinerating chamber, but not till the mourners have left the chapel. The incinerating chamber is filled with gas in a state of incandescence. The temperature attained is about 2,000° Fahr.

DERBY.—The foundation stone of a new church, which is being built on the site of a former church, dedicated to the Holy Trinity in the London-road, Derby, was laid on Wednesday afternoon July 15, by Mr. C. E. Newton, J.P.D.L., of Mickleover Manor. The total cost of the new church is £9,400. Messrs. Walker and Slater, of Derby, are the builders. The architect is Mr. C. E. Hewitt, of 118, Queen's-road, Brighton.

GREAT YARMOUTH.—The new municipal pier and pavilion erected by the corporation on the south parade on the site of the old Wellington pier was opened last week. It is 600ft. long, and 40ft. wide at its sea and shore extremities, but broadened out in its centre, where it is 136ft. square. It has been built on iron screw columns and piles of Jarrah wood. The columns are connected and braced with iron girders, upon which the deck of the pier, also of red Jarrah wood, has been laid. The sides have been filled in with metallic shields, bearing the Yarmouth and East Anglian arms alternately, this form of decorative ironwork being introduced as an ornamental variant on tubular railings. At the pierhead a fishing platform is to be constructed later. Seating accommodation has been provided along the sides in the usual form of continuous benching. The pavilion is a structure of original design, flanked by two dome-topped towers, 60ft. in height, the style being that of "L'art nouveau." Its design was modelled by the borough surveyor, on the type of buildings so much in vogue for Continental exhibitions. The pavilion has cost about £3,000. It is 119ft. in length, with a breadth of 90ft., and a height to the centre of the roof of 34ft. It has been built of wood, over a skeleton steel frame, and covered with Uralite. This Uralite has been extensively used both outside and inside the building, and also beneath the floor. The auditorium is clear of all pillars, and the only columns are those at the sides, from which spring the arched girders supporting the curved roof. Around the walls from the floor are panels of Lincrusta Walton, stencilled in a variety of artistic designs, and above these run a series of smaller panels, with moulded figures. The ceiling is white, relieved with squares in red Jarrah framing. As a clerestory a series of stained-glass panels have been introduced, representing the various stages through which the world's

shipping has passed. There are illustrated Julius Caesar crossing from Calais to the invasion of England, a Viking fleet, Cleopatra travelling up the Nile, William the Conqueror's ships, Illegist and Horsa's vessels, the *Great Harry*, one of the first British battleships, the Spanish Armada, and Nelson's ships. Across the west front is a stained-glass window showing a fleet of East Indian clipper merchantmen sailing away from the setting sun. The central floor space, covered with cork lino, is occupied with tip-up armchairs, upholstered in pegamoid, and tip-up padded benches. The space at the back and at the sides, with the raised gallery at the back, are all to be devoted to promenading. Accommodation will be found within the pavilion for 2,100 persons. Each of the columns at the sides admits a current of fresh air that circulates through the building, while in the ceiling are two openings that give the effect of a sliding roof. Lighting is supplied at night by 120 electric lamps, that stud the ribs of the roof and run down the walls. Outside the pavilion there is an installation of electric lights, each of which has a reflector at the back and a glass screen in the front. The windows just below the copper domes of the towers are to be filled with purple glass, behind which electric lamps are fixed. The buttresses on each side are surmounted by an ornamental steel finial, at the top of which an electric globe light has been placed. A stage has been provided, 32ft. wide and 26ft. in depth, which is fronted by a sunk orchestra of eight performers.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of the Council, a report was submitted by the Highways Committee recommending that the Council should seek power next session to construct new tramways of a total length of 29½ miles, and the doubling and reconstruction of existing tramways of a total length of 3½ miles at a total estimated cost of about £1,580,325. The street widenings necessitated thereby were dealt with by the Improvements Committee, and the total estimated amount chargeable to the tramways account in respect of these widenings was about £228,267. Amongst the tramways proposed are lines from Hampstead-road, along Tottenham-court-road, to Oxford-street; from the Westminster Bridge-road, via Victoria Embankment, to the north side of the Strand; from the Marble Arch to Cricklewood, and through the Blackwall Tunnel. The report was adopted. The Improvements Committee submitted their report on the proposals for improvements, for which it was suggested that application should be made to Parliament next session. The committee stated that the total net cost to the Council of the suggested county improvements was estimated at £456,534, after deducting the contributions from the local authorities. If the Council adopted the report in its entirety, the net amount voted for street improvements during the fifteen years commencing March, 1889, and ending in March, 1904, would be about £7,879,948, which represented an average annual vote of about £525,060. This report was agreed to. Upon the recommendation of the Technical Education Board, it was agreed to appropriate, at a cost of £30,000, a site in Southampton-row for the proposed London Day Training College. This site is next to that already allocated for the Central School of Arts and Crafts.

NORWICH.—The Grand Opera House, now in course of completion in St. Giles's and Goat-lane, will be opened on Monday, August 3, in the presence of the Mayor of Norwich (Lieut.-Colonel Harvey). It is a curious coincidence that a Colonel Harvey, who was then High Sheriff, opened the old Theatre Royal in Theatre-street, built from designs by William Wilkins, on March 27, 1826. Mr. W. S. R. Sprague, of Arundel-street, Strand, W.C., is the architect, and Messrs. Langden and Sons, Limited, of Sheffield, are the contractors for the new Opera House, which has a stone and cement elevation of Italian character facing St. Giles's-street. The entrance steps of the vestibule stand back 40ft. from the road. The vestibule, 27ft. by 8ft. 6in., leads into the grand crushroom, which is 30ft. by 20ft. There are four private boxes and numerous stalls. Over the pit is the dress-circle, above that the balcony, and then the gallery. Each tier is cut off from the one beneath it by a fireproof floor of cement and concrete, and the stage is separated from the theatre by a fire-resisting curtain of steel and asbestos. The stage is 70ft. by 40ft., and 50ft. high to the "grid." At the Goat-lane end, in a block quite

separate from the theatre, are the dressing-rooms, twelve in number. Under the theatre itself, in addition to the stage-cellar, are rooms for electrician, transformer's-room, gas man's room, band-room, property-rooms, &c. From the grand saloon at the front of the house a promenade opens over the St. Giles's frontage, forming a balcony 14ft. in width. The theatre is lit by electricity, and the paving in the vestibule, grand crushroom, and lavatories is to be of terrazzo, and elsewhere it will be granolithic.

SPARKBROOK, BIRMINGHAM.—Field-Marshal Earl Roberts laid, when at Birmingham on Saturday, the memorial-stone of the new headquarters of the 1st Warwickshire Royal Garrison Artillery Volunteers, in Stoney-lane, Sparkbrook. These buildings, which are to cost when completed between £8,000 and £10,000, will abut both on Stoney-lane and Dennis-road, and will cover an area of about two acres. The main hall will have a frontage to Stoney-lane, and will be built of brick, with stone dressings, in the Tudor style, from the plans of Captain Daniel, honorary architect. On the same afternoon Lord Roberts unveiled, in Chamberlain-square, Birmingham, the memorial of the Royal Warwickshire Regiment to their comrades who fell in the Soudan campaign.

WEDNESFIELD.—Some eighteen months ago the parish church of St. Thomas, Wednesfield, was destroyed by fire, and immediately afterwards a committee was appointed to carry out the work of rebuilding. Drawings were prepared by Mr. Fred T. Beck, architect and diocesan surveyor, of Wolverhampton, and the contract was placed in the hands of Messrs. H. Willecock, of Wolverhampton. The whole of the church has been rebuilt, except the main walls of the nave and the tower at the west end, which have been repaired and pointed, and new balustraded parapets have been erected. The opportunity has also been taken for the enlargement of the church by the addition of a chancel to accommodate the choir and clergy, seats for whom were formerly in the nave. The organ-chamber has also been enlarged, vestries for the choir and clergy have been provided, and a semicircular apse, forming the sanctuary, has also been added at the east end. The total cost has been about £5,000.

The completion is announced of the scheme for the extension of the Edinburgh Royal Infirmary. The expenditure on it has amounted in round figures to £136,000, including the cost of the site. This has all been met, save about £6,000, out of donations and bequests.

A mantelpiece and overmantel, all of statuary marble and Portland stone, have just been carried out and erected, at uncommonly short notice, in the hall of the Admiralty House, Mount Wise, Devonport. Everything has been commenced and finished within a very few weeks, in anticipation of a possible visit there by the Prince and Princess of Wales. The design was prepared by Mr. W. J. Clarke, the chief superintending civil engineer at Devonport Dockyard, and has been carried out in its entirety, under his immediate superintendence, by Messrs. Harry Hems and Sons, sculptors, of Exeter. This addition is 11ft. high. All the names of the various Commanders of the Plymouth station beginning with Vice-Admiral John Amherst, 1774, and ending with Sir E. H. Seymour, G.C.B., O.N., 1903.

Princess Henry of Battenberg laid on Wednesday the foundation-stone of the new permanent Emmanuel Church at Northwood, Middlesex. Nearly fifty years ago the foundation-stone of the parish church was laid. The population then numbered about 400 persons; it is now about 3,000, and has practically doubled within the last seven years. When completed the church will provide accommodation for 750 persons, at a cost of £7,500. The portion of the church at present to be built will seat 500, at an estimated cost of £5,000, towards which £3,500 is in hand.

Viscount Ridley at Blyth on Tweed unveiled a memorial in the form of a granite Northumbrian cross to the memory of the soldiers from that part of Northumberland who fell in South Africa.

The Dean of Rochester has received a cheque for £5,000 from Mr. T. H. Foorl, of Acorn House, Rochester, and the Granga, Botley, Hants, for the purpose of completing another section of the work of restoring Rochester Cathedral. The only condition imposed by the donor is that local builders shall, as far as possible, be employed in the work on the fabric. The Dean and Chapter will take the matter in hand immediately, and they also intend to make an effort to raise £1,500 for the repair of the organ.

COMPETITIONS.

COLWYN BAY.—In the competition for designs for a block of business premises proposed to be erected at the corner of the Penrhyn and Conway roads, Colwyn Bay, the first premium has been awarded to Mr. E. A. Lloyd, of Blackburn, Lancashire, and the second to Mr. D. M. Roberts, of Colwyn Bay.

CHIPS.

On Sunday, the mother church of Stonehouse, Devon, St. George's, was reopened after undergoing extensive renovation lasting upwards of two months.

The King of Spain has accepted the position of patron and honorary president of the International Congress of Architects, which is to be held in Madrid.

At a meeting of the Shipley Urban District Council on Tuesday night, plans were approved of new public offices, baths, and workshops, which are to be erected on the Manor House estate, at an estimated cost (exclusive of the site) of £24,000.

The finance committee of the Liverpool Corporation have received a report from Mr. T. Stirling Lee relative to the completion of sculpture at St. George's Hall. They have decided to recommend the city council to engage Mr. Stirling Lee to execute twelve figures above the panels on the east front of the hall, being part of the scheme of sculpture for the completion of the building.

The new police-station and public free library at the corner of Dewsbury-road and Hunstet Hall-road, Leeds, are to be formally opened by the Lord Mayor of Leeds this (Friday) afternoon.

The Bill confirming the order of the Local Government Board for the compulsory incorporation of the borough of Bootle with the city of Liverpool was rejected on Tuesday by a committee of the House of Commons.

A disastrous fire occurred at Todmorden on Saturday, the extensive woodyard and shop of Mr. Marmaduke Mallinson, builder, of Stansfield-road, Todmorden, being gutted. The damage is computed at about £3,000.

Mr. George Plowman, prominent in Philadelphia as the designer and builder of theatres, died in that city, July 7, of paralysis after a brief illness. He was the architect for the old Central Theatre, for the People's Theatre, and for the Grand Opera House.

Because inferior mortar was used in the construction of two big buildings at the United States Government Powder Works, Picatinny, they are to be torn down and others erected. The buildings are of brick, and were built at an expense of £3,000 sterling, a New York firm having the work. When the inspector from Washington went through the works lately he discovered that mortar had been used which was not up to the grade specified in the contract, and he immediately ordered the destruction of the buildings.

The official inspection on behalf of the Board of Trade of the route and line of the new tramway system connecting Blantyre, Hamilton, Motherwell, and Wishaw was made on Tuesday by Colonel Yorke. Colonel Yorke was accompanied by Mr. Trotter. The distance between Blantyre and Wishaw is 8½ miles.

The Royal Architectural Museum, Tufton-street, Westminster, which was recently presented by the Museum Council to the Architectural Association, as will be remembered by our readers, will be reopened to the public about April next, by which time the necessary alterations will be completed.

At Minchinghampton Church on Sunday, two memorials were dedicated. One is a stained-glass window, from the studio of Mr. H. W. Bryans, in memory of the late Mr. H. D. and Mrs. Ricardo, of Gatecombe Park, the subject being the Adoration of the Shepherds and Angels at the cradle of the infant Saviour. The other is a bronze tablet, in memory of the two men from this Cotswold hill parish who fell in the late war.

The late Miss Martha Leggatt, of Bramford House, near Ipswich, has bequeathed to the Ipswich Corporation for the Christchurch Mansion, in that borough, a painting of the Virgin, the Infant Jesus, and St. John, by Andrea del Sarto, and three other pictures.

The Hon. E. Lyulph Stanley, vice-chairman of the London School Board, on Monday opened three new Board schools in Plumstead. One in Bostall-lane is to accommodate 1,000 children, one in Wickham-lane 600, and one in Church Manor-way 900.

The additions to the borough sanatorium, Sunderland, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, those previously supplied having proved satisfactory.

Engineering Notes.

THE INVERGARRY AND FORT AUGUSTUS RAILWAY.—This new line was formally opened for traffic on Wednesday. It is worked by the Highland Railway Co. The necessity for a rapid means of transit through the Great Glen of Scotland is great. The canal steamers take over eight hours to do the journey of 60 miles between Banavie and Inverness. By means of the new railway the journey will be shortened by at least an hour, but ultimately the Highland capital must be connected direct with the west by rail. The Highland Railway Co. contemplate applying to Parliament for powers to construct a light railway to the northern end of Loch Ness, and, if they be successful in that, another hour would be cut off the Strathmore journey, and passengers would be landed at the Highland Station in Inverness, instead of having to disembark, as at present, at Muirton Locks. Leaving Spean Bridge contiguous to the West Highland Railway Co.'s station there, the Invergarry and Fort Augustus line follows the course of the Spean for several miles. This river is crossed about a mile from the start on a girder bridge erected at a height of over 70ft. above the river. At High Bridge—one of General Wade's structures—the railway passes close to the spot where the first shot in connection with the Jacobite rebellion of '45 was fired. To Gairloch, a run of about three miles, the country is barren, but a backward view reveals the snow-clad Ben Nevis towering above adjacent heights, while in the western distance the hills of Ardgour and waters of Linnhe Loch have their own special charm. After leaving Gairloch the railway takes a sharp curve in a north-easterly direction, and traverses some wooded glades in the estate of Glenfintaig. A viaduct carries the line over the River Gloy, at a height of 60ft. above the bed of the river, the central girder of the viaduct having a span of 100ft. From Invergloyle the line rises to an elevation of 350ft. above the loch level, and clings in side cutting to the hillside. The summit of the line is reached about eight miles from the commencement, and at Laggan there is a gradual fall to the canal level. Loch Oich now comes within view, and following the eastern shore of this stretch of water the line has been formed on short embankment and through light rock cutting. A tunnel of about 67yds. in length occurs on this stretch, and after emerging therefrom, the Culder burn is crossed on a skew viaduct of five spans. Flouting had to be resorted to in order to carry the track through a moss cutting a little to the north, and when passing a shallow arm of Loch Unigan the slope has been pitched with boulders to prevent scouring. A run of three miles down a valley, separated from the river and the canal by a low range of hills, brings the termination of the line within sight. Immediately to the east of Fort Augustus the line is carried across the canal by means of a swing bridge of 54ft. clear span, and in order to land passengers at the Loch Ness pier, the railway has been carried across the river Oich on a viaduct consisting of four spans, two of 100ft. and two of 50ft. Twenty-four miles in length, the construction of the line was carried out by Messrs. James Young, Ltd., Glasgow, and the estimated cost of the undertaking was £250,000. The engineers were Messrs. Formans and MacCall, Glasgow.

The church of St. Paul, Stafford, was reopened on Sunday after redecoration. The work of decorating the church was intrusted to Messrs. Brookfield and Wilmshaws, of Stafford.

The library, museum, and arts committee of the Liverpool Corporation are publicly exhibiting this week the large mural decoration recently executed for the Toxteth Branch Library by two young Liverpool painters, Messrs. W. Alison Martin and Clinton Balmer; also a panel in repoussé copper and enamel, designed and executed by Mr. C. E. Thompson in commemoration of the opening of the library by Mr. A. Carnegie.

Mr. Lyulph Stanley (vice-chairman of the School Board for London) has opened a new building in the Aristotle-road, Bedford-road, Capriam. It is called the Haselrigge-road Senior Girls' School, and is to be a higher-grade school. There is accommodation for 450 pupils. This is the first school under the Board erected entirely for senior girls, and the old Haselrigge-road School will now be left entirely to the boys. Messrs. Garrett and Son, of Clapham and Balham, were the contractors for the new school.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—R. J. B.—H. K. (Newcastle).—T. R. M.—C. M. S.—P. L. and Co.—A. W. T.—C. B.

Correspondence.

THE BUILDING TRADE IN SOUTH AFRICA.

To the Editor of the BUILDING NEWS.

SIR,—While several communications have appeared in home papers pointing out the shortage of workmen which the building trade in Cape Town, Durban, and Johannesburg has been experiencing, and the advantages to be found by men emigrating to these towns, so far no notice has been taken of the needs of Port Elizabeth, and it is in the hopes that the "Cry from Macedonia" may have the effect of turning the attention of good tradesmen to this port that you are asked to be good enough to insert it in your journal.

In common with the rest of South Africa, the building trade in Port Elizabeth is extremely brisk, despite the great and increasing advance in the cost of labour and the difficulty in obtaining good tradesmen. All the builders in the town have had their hands full of work, so much so in fact that architects have the greatest difficulty

in obtaining tenders for contemplated buildings. For jobs of any size or importance an average number of tenders is about three or four, whilst the time required by the tenderers for completion of works is fully one-third more than was formerly the case, and the price nearly double.

A number of large buildings are now in course of erection or of completion in the town, including among others the new premises for the Bank of Africa, a terracotta building for which Mr. W. H. Stucke, of Johannesburg, is architect, a seven-story building in Main-street for Messrs. Cathbert, for which Messrs. Hubert, Walker, and Tomlinson are architects, a large block of residential chambers and shops facing Donkin Reserve, a three-story island block of warehouses for the Harbour Board Commissioners, and the new administrative offices for the same body (Messrs. Victor T. Jones and W. J. McWilliams being the architects for the three latter), as well as numerous other warehouses and buildings of a less important character, while the erection of several "skyscrapers" is also in contemplation.

The projected scheme of the Harbour Board for a new harbour and wharves on a huge scale at the mouth of the Zwartkops River will undoubtedly cause a demand for new warehouses, &c., in that quarter of the town; and, in general, the prospects of the trade in Port Elizabeth are extremely good if labour can only be procured in sufficient quantities to enable work to go on in a more rapid and economical manner.

The increase in the wages of workmen owing to their scarcity is, of course, the principal factor in the present high prices of building work. Whereas in June last year carpenters were asking 1s. 5d. and bricklayers 1s. 4d. per hour, in the same month this year carpenters are obtaining 2s. 3d., and bricklayers 2s. and 2s. 1d., and many are but only half-competent men at that. Bricklaying is largely in the hands of the Malays, although lately a few London and Australian bricklayers have been specially brought out by the contractors for two of the largest jobs.

The permanent barracks and camps being built up country for the military authorities have drained the coast towns of men, as much as 2s. 6d. an hour being paid to carpenters by the contractors for these works; and, in fact, in tendering for work in Port Elizabeth, builders are already allowing for a probable increase in prices to that extent.

That this town is worse off for workmen than either Cape Town or Durban is due to the fact that no line of steamers sails direct to this port, while men coming to the country leave the boat usually at the first port of arrival, generally with the idea of proceeding to the Rand.

Workmen who contemplate emigrating to South Africa could not do better, therefore, than to make for Port Elizabeth, any decent tradesman being certain of employment at good wages, while the cost of living, compared with that of other South African towns, is fairly moderate. Contractors with a little capital would also probably do well in the town, as the present contractors are almost overburdened with work.—I am, &c.,

Port Elizabeth, June 26. M. S. A.

Mr. W. B. Purser, of Horsham, who has held the appointment of surveyor and bridgmaster to the West Sussex County Council since 1896, has been elected road engineer to the Kesteven County Council.

In the House of Lords on Monday, the City and South London Railway Bill, providing for an extension from the Angel, Islington, to King's Cross, St. Pancras, and Euston, and transferring to this company the powers of the City and Brixton Railway Scheme, was read a third time and passed. The Romford and District Tramways Bill was also on the same evening read a third time and passed. Both measures have already been through all stages in the House of Commons, and only await the Royal Assent.

Mr. John Tweed, sculptor, has just completed the statue of the late Colonel Benson, R.A., which is intended to be erected near the old abbey at Hexham. It represents an officer who has checked his stride for the purpose of conveying some instructions to an "orderly." The face is turned slightly to the right, while a field-glass is held ready for any observation that the field may require. The figure stands 9 ft. high, and will stand on a 12 ft. pedestal of granite.

A House of Lords Committee passed, on Friday, the unopposed Bill promoted by the London United Tramways Company, empowering the company to carry out certain road widenings and improvements in Barnes, Richmond, Twickenham, and Teddington at a cost of about £100,000.

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Our Illustrations.

MEMORIAL TO THE LATE E. ONSLOW FORD, R.A., ST. JOHN'S WOOD.

The memorial to the late Edward Onslow Ford, R.A., has now been erected in St. John's Wood, within a few minutes' walk of the late sculptor's studio. It is in the form of an obelisk; on one side it is adorned with a replica of the Muse at the base of the Shelley memorial at Oxford—one of Onslow Ford's works with which he himself was best pleased—and on the other by a medallion portrait of the sculptor. The whole is suitably protected with railings and lamp-posts. The selection of Mr. John W. Simpson to prepare the design of the memorial was a much-valued recognition, as coming from brother artists of high standing. The problem was a somewhat difficult one, as the slight and graceful figure of the Muse from the Shelley memorial had to receive a setting which, while in suitable scale with the delicate subject, should, at the same time, form a sufficient mass to hold its own at the wide junction of Grove Road and Abbey-roads. Mr. A. C. Lucchesi undertook the modelling of the portrait medallion on the north side. The masonry is of selected white-bed Portland stone, from the quarries of the Bath Stone Firms, Limited, and was executed by Mr. Tomes with great personal care and attention. The casting of the bronze lamps and the collar of the obelisk with voluted angles was intrusted to Mr. Omar R. Albrow. The principal figure was cast by Mr. A. Parlanti. The monument is so placed as to leave the full carriageway of the three roads surrounding it clear and unimpeded.

PARKWOOD, HENLEY-ON-THAMES.

This picturesque riverside house, from the designs of Mr. William Flockhart, the architect, is finished with stucco for the external walling, and inside the building is elaborately fitted with panelling, &c., in hard woods. A great feature is made of the big hall. We shall, at an early date, give an interior from the architect's Academy drawing, when we may give a plan and other particulars.

A ROW OF NEW HOUSES, HORNTON STREET, KENSINGTON.

The rebuilding of Horton-street is being carried out by Messrs. W. A. Daw and Son, of Palace Gate, from the designs of Mr. Frank S. Chesterton, architect of Cheapside, E.C. The fronts are in red brick and a white French stone (Palotte). The roofs are covered with hand-made red tiles. The height of the buildings was restricted, and only a limited number of gables allowed. The frontage of each house is 21ft., the number of houses eighteen. The depth of the site is such that no break in the main frontage

line was permissible. Horton-street rises about 2ft. 6in. in every 100ft. The plan, with the exception of a large hall, is the usual one for a town house with three reception-rooms and nine bedrooms. A portion of the design is shown in the Royal Academy Exhibition.

BRIGHTON AQUARIUM RECONSTRUCTION.

In August, 1901, the Brighton Corporation obtained powers under a Parliamentary Bill to purchase the Brighton Aquarium buildings, freehold, for £30,000, and for the expenditure of some £60,000 upon a scheme of reconstruction in accordance with a plan prepared by Mr. A. Hessel Tiltman, F.R.I.B.A., of 51, Russell-square, London, who had been previously, in 1900, appointed by the corporation their consulting architect in this matter, for which a competition for designs was proposed at that time. It may be remembered that some thirty years ago there was a popular movement all over the country in favour of the establishment of public aquaria for the convenient study of anatomical and physiological problems in marine botany and zoology, and the present Brighton Aquarium and many others of a similar character were the immediate outcome. A large proportion of these buildings, notably those at Westminster, Southport, Scarborough, and others of less importance, failed, and are no longer in existence. Brighton Aquarium, one of the first of the original establishments, and probably the best arranged and most complete of all, is now almost the only considerable institution of its kind remaining. Erected in 1872 at a total cost, roughly speaking, of £120,000, the buildings occupy a site abutting upon the Madeira-road of 715ft. long, with a width varying from 42ft. to 102ft. It contains about 40 tanks, ranging from 10ft. to over 100ft. in length. No. 6 tank, designed for porpoises, congers, turtles, and other animals of larger size, has an area of 4,620ft. super., a frontage of 126ft., and a water capacity of 113,000 gallons. The corporation, on obtaining possession of the buildings, were faced by a problem of very considerable difficulty, to the anxious consideration of which the Aquarium Committee, representing the best business instincts of the town, have been directed for the last three years—unfortunately, so far, with no settled conclusions as to the best policy to adopt in their utilisation. Whilst it is desired by some to retain the educational value of the "Marine Zoological Garden," as it was called at first, it has to be recognised that the maintenance and supply of the inhabitants of the tanks, &c., together with the care of a building covering some 35,000ft., involves a very large sum annually. Unfortunately, aquaria as an element of entertainment have lost of late years much of their novelty and attraction. Moreover, the present condition of the premises renders imperative structural and decorative repair, with fresh engineering plant, &c., even to properly rehabilitate the buildings for their present purpose. All this contributes to render the task of the committee a very formidable one. They naturally desire, even in adding this institution to the other excellent series of educational and recreative establishments of the municipality, to render it self-supporting—an object, however, it should be remembered, that has been attained in no other instance. In furtherance of their study of this problem, the committee, at an early stage of its consideration, visited, in company with Mr. Hessel Tiltman and Mr. F. J. C. May (the borough engineer) many of the existing institutions of a similar and allied character, with the result that it was finally resolved to combine with the Aquarium, reconstructed and enlarged, the additional attraction of a Winter Garden, and converting at the same time the flat roofs into a free and open space laid out suitably as gardens, &c. Two separate schemes based upon this idea recommended by the committee, on being submitted to the Borough Council, were finally rejected, and the subject of our illustration in to-day's issue forms the last of some four or five schemes which, to the instructions of the committee, have been prepared and reported upon by Mr. Hessel Tiltman. In principle this scheme retains the present Aquarium establishment, but relies upon artificial means only for its lighting, as at Blackpool and some of the Continental establishments, utilising the very large expanse of flat roofs for a large new Winter Garden. The chief feature of this latter is a long arcaded avenue 22ft. wide and 500ft. in length (with a possible extension in the future of a further 300ft.). Along the northern boundary of

this avenue is shown a range of some 50 lock-up shops; whilst the side opposite and seaward is occupied by a large music annexe, café restaurant, tea-house, palm-house, aviaries (both internal and external), arbours, and ferneries, together with ladies' and gentlemen's retiring rooms. Outside are an outdoor bandstand and space for seats round same; restaurant, piazzas, tea gardens, the remainder of the area being laid out for a terrace promenade with fountains, ornamental flower-beds, fishponds, &c. The extended length (on land belonging to the corporation and connecting up with the shelter in the Madeira-road) might have been used probably as a botanical adjunct. In this design Mr. Hessel Tiltman has adopted a modified form of Indian (Jeypore province) style, as best enabling him to connect up the form of his work with that of the existing building. It was proposed to construct the new buildings with coloured glazed bricks, faience ware, plaster, with ornamentally glazed and copper-covered roof. The estimated cost of the work comprised in this scheme was between £38,000 and £40,000.

LIVERPOOL CATHEDRAL.

We illustrated the main side elevations of Mr. Malcolm Stark's design for this big church in the BUILDING NEWS for June 5, at the time his plan appeared. On June 19 the main entrance front was published in detail, and on July 10 an elevation of the choir end, with the tower and spire, was reproduced. To-day we print photographs of Mr. Stark's east elevation for the cathedral, and the longitudinal section, accompanied by a plan of the groining over the great octagon, which is not emphasised on the exterior of the building save by a flèche which rises over the crossing. It is interesting to compare this treatment with those which form such distinguishing features in the designs submitted by Messrs. Austin and Paley, and by Mr. Nicholson, as already illustrated in our pages.

DESIGN FOR A SMALL LIBRARY.

A proposed library for a country town, to cost £1,500, designed by Mr. James A. Swan, architect, of Birmingham. On ground floor accommodation is provided for 12,500 volumes in lending department, and 86 readers in reading-room and ladies' room. The first floor contains a reference library and patent library. The materials are walling of red bricks, stone dressings, and Stow-in-Wold slates.

SALE ROOM AND OTHER SKETCHES.

This curious old oak Elizabethan Escoignure, dated 1603, which originally came from an old farmhouse near Driffield, Yorkshire, was recently sold at Messrs. Phillips, Son, and Neale's Rooms. The panel door is carved with cross swords, battle-axes, crosses, keys, &c., and on the top of the panel is the inscription, "William Shakespeare, 1603." Notwithstanding its great age (300 years), this little piece of furniture is in an excellent state of preservation. The Chair is of later date, also of oak, with scroll arms, leather seat, and back studded with bronze nails; the legs are plain, tied together with a broad carved rail in front. The second Cabinet or Credence is of Gothic design, and probably of German workmanship of the 15th century.

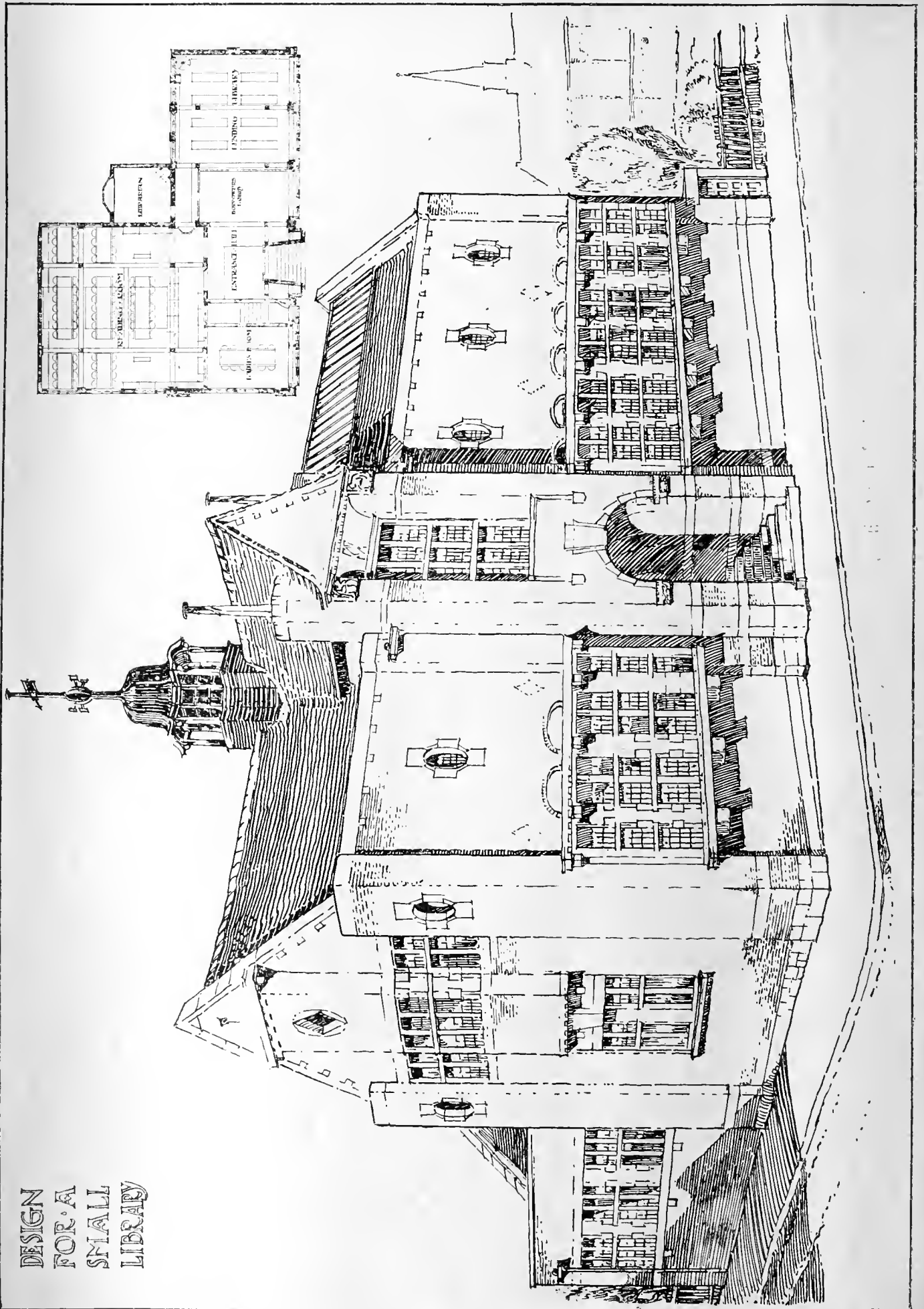
The Fulham Borough Council have decided to spend £362 in the redecoration of the town-hall buildings, which it is proposed to extend.

Mr. H. Ross Hooper, an inspector under the Local Government Board, has held an inquiry at Cotchester into the application of the council for sanction to borrow £6,933 for purposes of electric lighting.

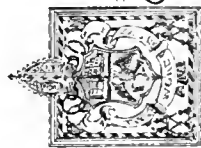
According to a request by the Holborn Borough Council, the Benchers of the Honourable Society of Gray's Inn have generously determined to pull down the north wall of their gardens, which at present shuts out all view of the same from Theobald's-road, and replace it with a dwarf wall and handsome iron railing. This alteration has been decided upon "as an earnest of the Benchers' desire to add something to the amenities of the Borough of Holborn, of which Gray's Inn now forms part."

The adjudication in bankruptcy against Benjamin Haynes, of Penge, S.E., builder, has been annulled on the payment of debts in full.

At the last meeting of the Glasgow Corporation Lord Provost Primrose intimated that an organ, costing £2,000, would be placed in the Springburn Halls, half of the money being subscribed by Mr. Hugh Reid, Springburn, and half by Mr. Carnegie.



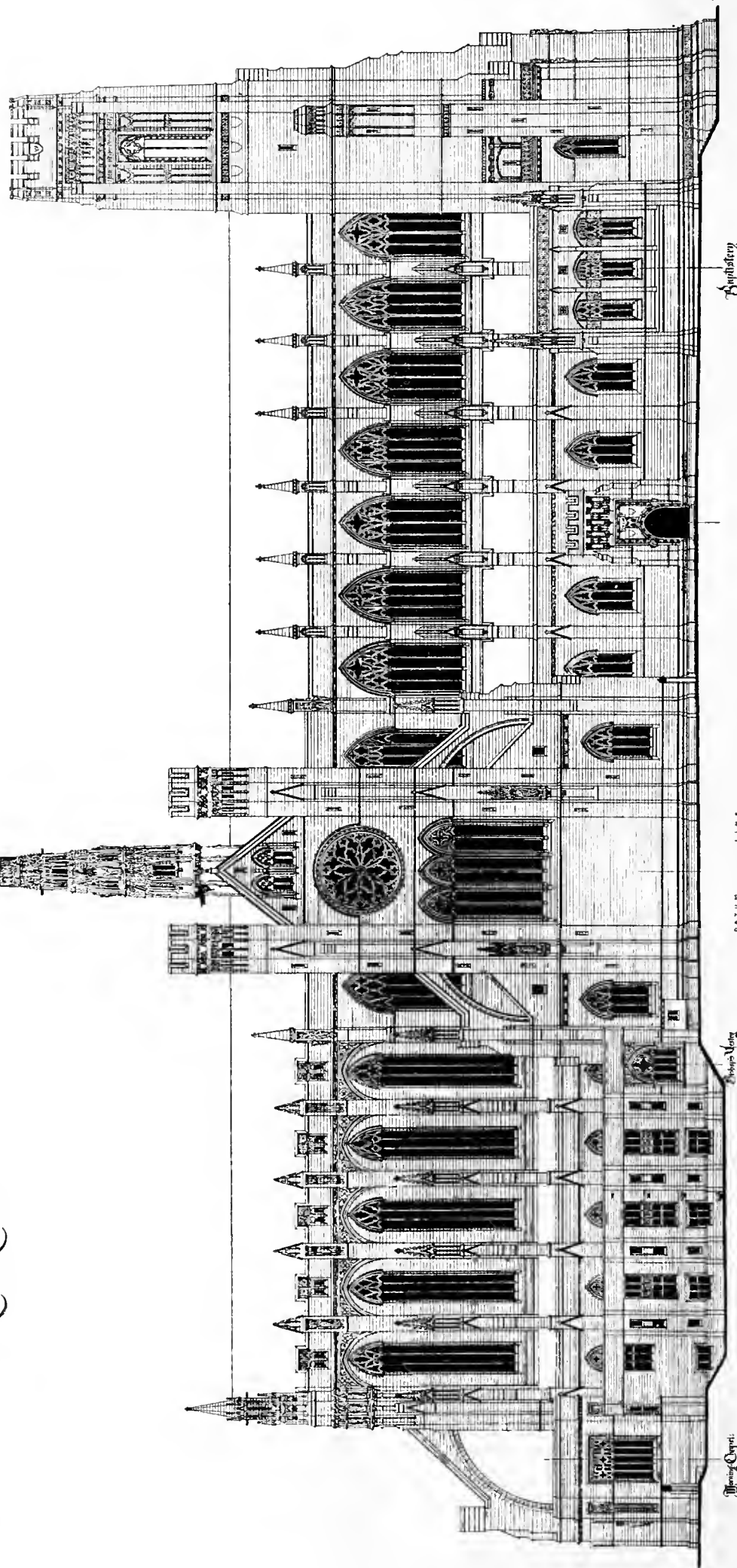
THE BUILDING NEWS, JULY 24, 1903.



Liverpool: Cathedral.

East: Elevation.

DESIGN BY MALCOLM STARK, ARCHITECT.



J. Stark

Architect

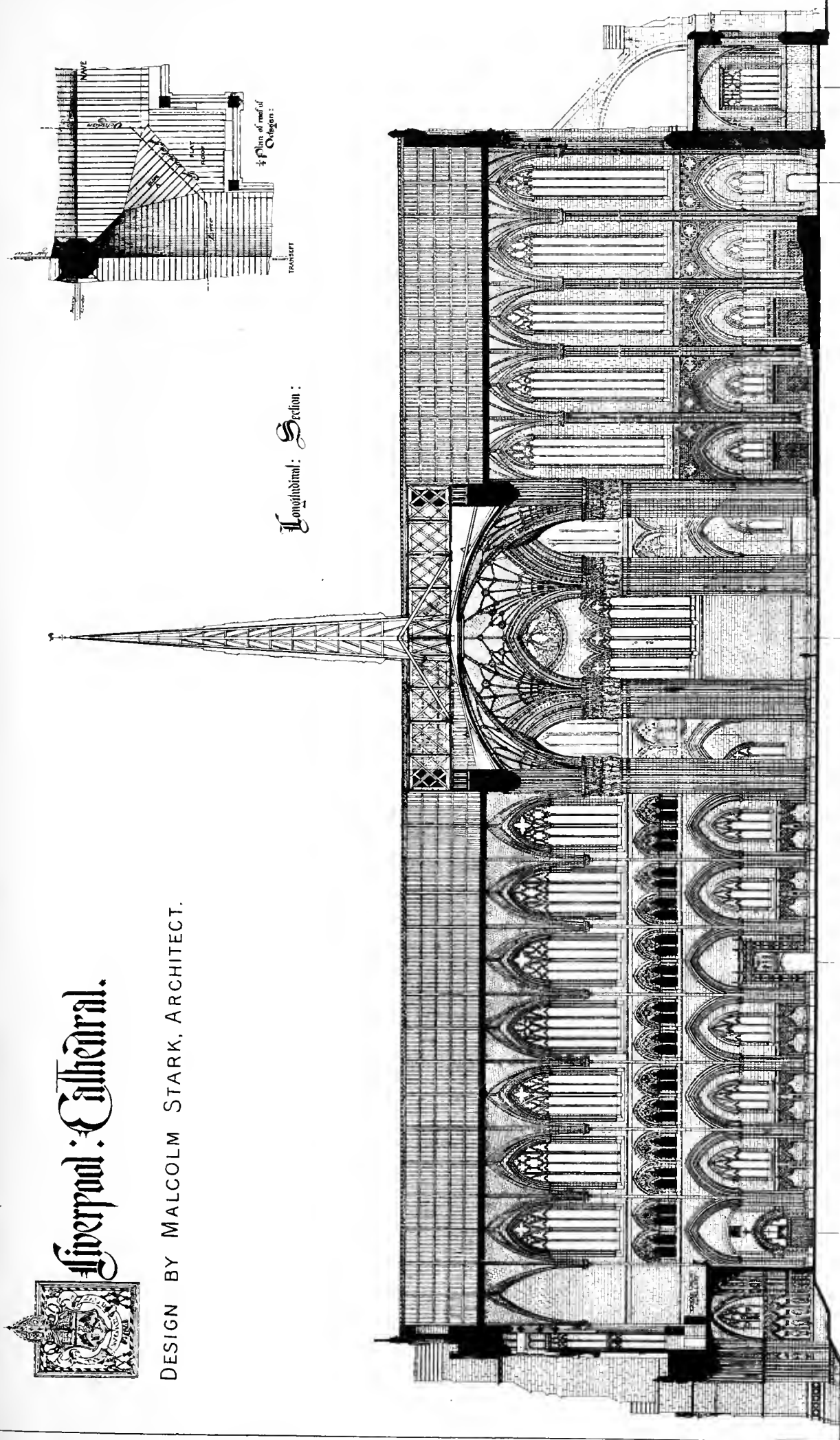
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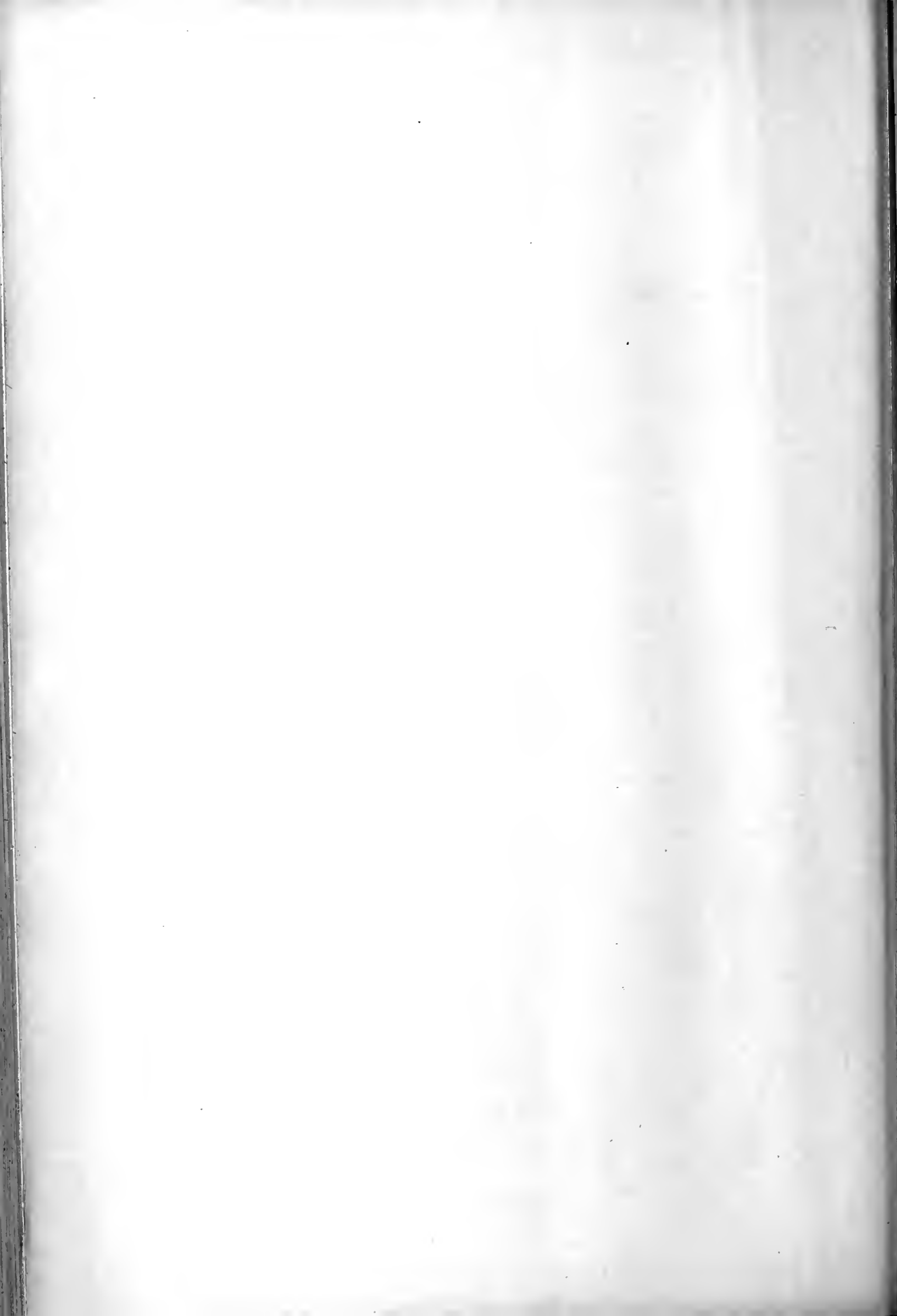
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Liverpool Cathedral.

DESIGN BY MALCOLM STARK, ARCHITECT.

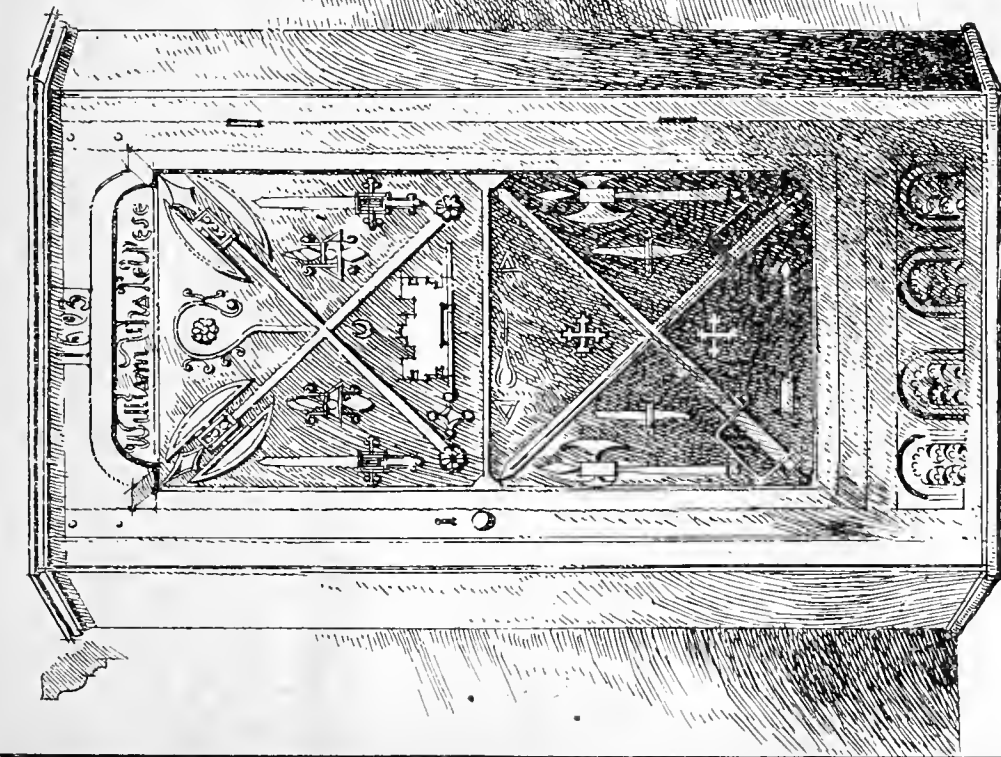




SALE ROOM AND OTHER SKETCHES.



DETAIL OF WIRGE

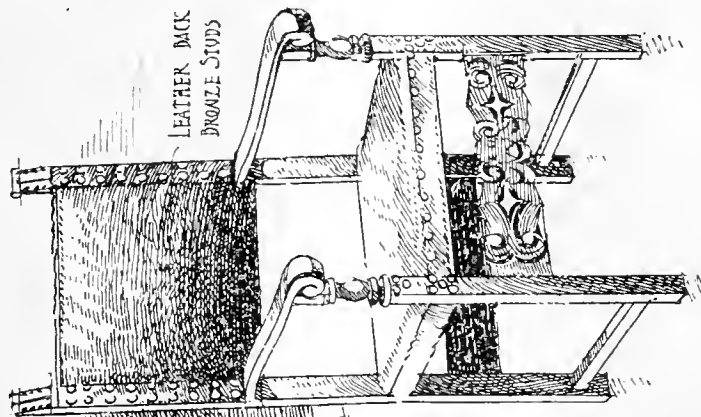


AN OAK ESCOIGNORED 1603

— ORIGINALLY FROM AN OLD YORKSHIRE FARA HOUSE —

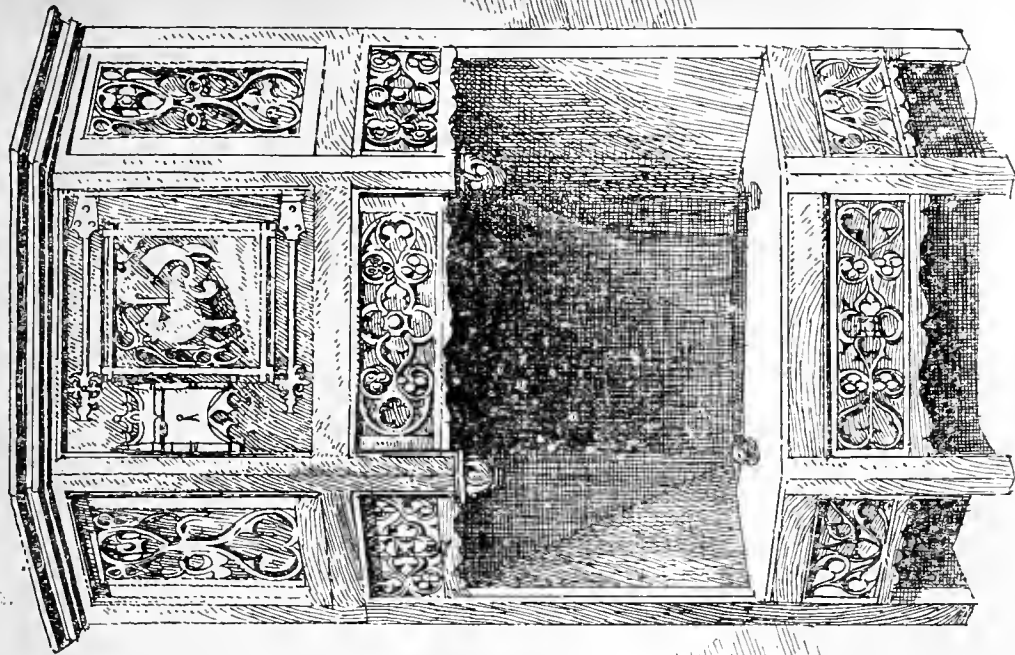


DETAIL OF CARVED NAME AT TOP PROBABLY
INTENDED FOR WILLIAM SHAKESPEARE.



LEATHER BACK
BRONZE STUDS

CHAIR OF THE 17TH CENTY



A GOTHIC CABINET OF THE 15TH CENTY

STATUES, MEMORIALS, &c.

CANTERBURY CATHEDRAL.—At a meeting of the late Dean Farrar's friends, held at Canterbury on April 21, it was decided that an executive committee should be formed, and should be empowered to determine the form which the memorial to the Dean should take. The executive committee met on Wednesday in the Jerusalem Chamber, Westminster Abbey, under the presidency of Viscount Peel. It was reported that £180 had been collected before any public appeal had been made. It was resolved that, in the event of the necessary funds being obtained, the memorial to the late Dean of Canterbury should take the form of carrying into effect his design for filling the west window of the Chapter House of the cathedral with coloured glass to match the east window, and of completing certain details in the restoration of the Chapter House.

ONICH, N.B.—The memorial to the late Rev. Dr. Stewart, "Nether-Lochaber," was unveiled at Onich, on Loch Linne, opposite Ballachulish, on Saturday. The monument consists of a Celtic cross, something after the style of the famous St. Martin's cross at Iona Cathedral. From the base to the top it is about 20ft. high, and is richly decorated with Celtic lacework. It is not to be placed in the churchyard, but on a knoll or rock by the roadside at Onich, not far from the manse which was long occupied by Dr. Stewart. The position chosen is a very commanding one, looking away down Loch Linne on the one side and up Loch Leven on the other. There was a competition for the memorial, and the commission was secured by Messrs. Gray and Co., 460, Sauchiehall-street, Glasgow.

CHIPS.

Mr. T. P. O'Connor, M.P., will unveil the Robert Buchanan Memorial in the churchyard of St. John the Baptist, Southend, on Tuesday next.

The preamble of the Bill authorising the Corporation of Cardiff to construct additional lines of tramway has been passed in the House of Commons.

The new United Methodist Free Church and Sunday-school erected at Tarsat, at a cost of about £600, were formally opened on Saturday. The building has an open roof of pitch-pine, and is seated with pitch-pine seats. The contractors were Mr. Thos. Weightman, Lane Head, and Mr. Lawson, Greenhaugh.

A marble bust of Chaucer, by Mr. G. H. Frampton, R.A., and now on view at Burlington House, has been presented to the London City Corporation by Alderman Sir Reginald Hanson, and will be placed in the Guildhall Library.

On Wednesday week the Bishop of Dover dedicated the lych-gate which has been erected at the western entrance to the Abbey Churchyard, Minster, in Sheppey, as a memorial of the coronation of King Edward VII.

The foundation-stone of the church of St. Michael and All Angels, Foulridge, in the parish of Christ Church, Colne, Lancashire, was laid on Saturday by Mr. W. W. B. Hulton, Constable of Lancaster Castle. The church is a simple rendering of Early Perpendicular from designs by Mr. R. Bassnett Preston, A.R.I.B.A., of Manchester.

The Hunts County Council, at their last meeting, agreed to raise the salary of Mr. Leete, the county surveyor, from £300 to £500 a year.

The museum and school of art committee of the Birmingham Corporation have unanimously appointed Mr. Arthur J. Gaskin as headmaster of the Vittoria-street School for Jewellers and Silversmiths, in succession to Mr. R. Catterson-Smith, recently appointed headmaster of the central and branch schools.

A Worcestershire County Council inquiry was opened at Evesham on Monday in regard to an appeal by the local Town Council for steps to be taken to restore the navigation of the Avon between Evesham and Cleeve Mill. Mr. S. R. Locock, civil engineer, Westminster and Birmingham, described the scheme adopted by the corporation. At Lower Harvington, where the weir was washed away, it was proposed to construct a weir 2ft. 6in. The height when the navigation was in existence was 3ft. more than that, so that there would be no danger of flooding the meadows, particularly as the banks were high. The total cost of the scheme would be £1,532, or, with a bridge instead of the raised ford, lock, and sluices at the Fish and Anchor, £6,400. Mr. Henry Evershed, engineer, Rushford, gave similar evidence. The scheme was opposed on behalf of the riparian owners, and the inquiry was adjourned.

The Primitive Methodist Church, Pittshill, Tunstall, Staffs, was reopened on Thursday in last week, after redecoration and the building of a new organ. The organ has been built by Messrs. Steele and Keay, Burslem, at a cost of £375, and the other improvements, including the addition of a vestry, have cost £200.

LEGAL INTELLIGENCE.

TRADE UNION LAWSUIT.—DAMAGES AGAINST A SOCIETY.—At Manchester Assizes on Wednesday was continued the trial of an action brought by Mr. James Carr, master painter and decorator, to recover damages from the National Amalgamated House and Ship Painters and Decorators and Frank Lowe, delegate of the society, who the plaintiff alleged had unlawfully induced persons to break contracts with him and not to enter into contracts with him, and who, further, had conspired together to injure him. The defendant Lowe, in the witness-box, admitted that he did Carr out of the job of painting one of the corporation tramcar sheds by lodging a complaint that an unfair house had tendered, and threatening that if Carr got the job he would withdraw all the society's men from any work for the corporation. The judge put to the jury a number of questions in writing. In answering they found that the defendants had in specific instances conspired maliciously and with intent to injure plaintiff, and had procured workmen to leave his employment and continue away from it, and had prevented a firm of builders from accepting the plaintiff's tender, and, further, had prevented and obstructed him from carrying on his trade. The damages were assessed at a total of £332. Commissioner Bray gave judgment for the plaintiff.

BUILDING BY-LAWS PROSECUTION.—A special meeting of the Coventry magistrates was held recently to deal with twenty-nine summonses that had been issued against William James Bromley, 103, Holyhead-road, for alleged breaches of the building by-laws in the erection of houses in King Edward's-road and Coronation-road. In thirteen cases affecting the Coronation-road buildings it was alleged that the walls inclosing the houses were put together with mortar which was not good, whilst in the King Edward's-road cases it was asserted defendant did not have the dividing walls, which were set at right angles to the front wall, properly bonded. Mr. Parfitt, for the defence, contended that defendant had used well compounded mortar, and that the city engineer had taken an incorrect view of what the material was composed of. Because accidentally a contemptible quantity of roots and vegetable matter might have been mixed up with the mortar, it was suggested that it was of improper quality. He urged that the Bench should not pay too much attention to the by-laws made by men who knew little or nothing of the commercial side of the question. Defendant and numerous other witnesses were called to give evidence of which the purport was that the mortar was good. It was arranged to take the Coronation-road houses summonses next week, and in the cases gone into at much length on Friday the Bench said they were of opinion that the mortar used was not in accordance with the requirements of the by-laws, and therefore fined defendant 40s. and costs. The evidence was accepted as binding on the other cases, in each of which a nominal fine of 1s. and costs was imposed.

SERIOUS CHARGE AGAINST AN ARCHITECT'S ASSISTANT.—Before the Wrexham Borough magistrates on Friday, Lewis Henry Cooke, architect's assistant, pleaded guilty to having forged a cheque for £9 6s. 4d., and also to having fraudulently obtained that sum by means of the cheque. The evidence showed that Cooke had been five weeks in the employ of Mr. Slater, architect. On July 7, Mr. Slater learned that a cheque purporting to bear his signature had been passed to Parr's branch bank at Wrexham from the North and South Wales Bank for payment. The cheque did not bear his signature, and it was found that it had been cashed by Mr. Owen Pritchard, boot and shoe dealer, with whom prisoner lodged, and who, believing it genuine, had cashed it. Prisoner was received by Inspector Bagshaw from the Winchester City Police, he having given himself up there. He was committed for trial.

The office of borough engineer and surveyor and waterworks engineer to the corporation of Sudbury is vacant, Mr. T. W. A. Hayward, after six years' work in that position, having just been appointed borough surveyor and engineer of Stamford from 196 applicants. Mr. Hayward is also retained as consulting engineer at Sudbury, by which corporation he has been presented with a honorarium of £450.

Sir William Broadbent laid, on Tuesday, the foundation-stone of an administrative house, the gift of Mr. J. Passmore Edwards, at Chalfont Epileptic Colony. Sir William read the following telegram from the Prince of Wales, President of the National Society for the Employment of Epileptics:—"I heartily congratulate the Chalfont Epileptic Colony upon the ceremony in which you are to-day assisting. I trust that the good work of the institution may be largely extended by means of the new buildings which are to be erected through the liberality of Mr. Passmore Edwards, and the foundation-stone of which will be laid by you to-day."

PARLIAMENTARY NOTES.

PROPOSED MILITARY WORKS.—Mr. Brodrick moved in Committee on Tuesday a resolution authorising a loan of £5,000,000 for the construction of military works. The money, he stated, was required for the completion of defence works which Parliament had agreed to; for providing housing accommodation for troops in this country and hutting accommodation for the 25,000 men who were to be stationed in South Africa, estimated to cost £2,500,000; for the erection of storehouses for the reserve of stores, and for providing training grounds and rifle ranges. For this last purpose a sum of £700,000 was wanted. The Secretary for War stated subsequently that the Bill based on the resolution would be put down for discussion on Friday (to-day). The resolution was agreed to.

CHIPS.

Lord Monkswell, on Saturday, opened Fulham Park extension to the public. On the south Fulham Park, including the additional strip of land dedicated to the public, is bounded by the Fulham reach of the Thames, and on the north by the Bishop's Moat. The added portion contains a lake which almost surrounds a square of grass, which will be used as a croquet lawn or bowling green. The lake is fringed on the east side by a children's sandbank. The borough engineer, Mr. F. Wood, has carried out the whole of the works of design, construction, and supervision of the extension.

The laying of the memorial-stones for the Corporation-road infant school at Darlington took place on Friday. The new schools will accommodate 219 infants, and will cost about £3,832.

The dedication of the tower and bells of Ridlington Church, after restoration, took place on Monday. The work done includes recasting and rehanging the bells; rebuilding the upper part of the tower, by Messrs. Dalby and Sons, Uppingham; and erection of an oak belfry screen from the designs of Mr. W. Talbot Brown, of Wellingborough, by Messrs. Stanon and Sons, of Ketter. The tracery of the latter and also an oak reredos were carved by the rector.

The new cope presented to Truro Cathedral for the use of the bishop of the diocese is of cream and gold damask, with richly embroidered red hood and orphreys, designed by Messrs. Bodley and Co., and is the work of the Community of the Epiphany, Truro.

The new post-office at Oundle was opened on Monday. It has been built by Messrs. Siddons and Freeman, contractors, of Oundle.

On Wednesday week, two memorial windows, erected in St. Mary's Church, Stretton, by Mr. John Gretton, M.P., and Mr. F. Gretton, to the memory of their father, were unveiled and dedicated. The windows were designed by Sir William B. Richmond, and represent the Ascension and the assembly in the upper room at Jerusalem on the Day of Pentecost.

Mr. John Caxton Lawrie has been appointed president of the Sanitary Inspectors' Association of Scotland.

The foundation-stone was laid on Saturday of the new chancel now being built in connection with St. Martin's Church, Brighouse, and estimated to cost £1,000.

Mr. H. W. Richards has been appointed principal of the London County Council Brixton Technical Institute. The institute, which will be opened next session, is situated in the Ferndale-road, Brixton, on a site formerly occupied first by a polytechnic and then by public baths, both of which proved unremunerative in working. It is intended to be an important centre for instruction in building trades. Mr. Richards has had wide experience both in practical building work and in teaching building trade subjects. For many years past he has been engaged in teaching in the evening classes at polytechnics and technical institutes, and for the past seven years he has held the position of head of the building trades department at the Northern Polytechnic, Holloway.

The Rochester and Chatham Tramways Bill has been passed by a committee of the House of Commons, having already gone through the House of Lords. The tramways to be constructed by the Rochester Corporation are wholly within the boundaries of that city. A number of street widenings and improvements are contemplated, the total cost of the scheme being estimated at £140,557, of which £66,109 is for the construction of the tramways, inclusive of the overhead electrical equipment and the distributing cables. The main proposals of the company are the construction of a new tramway, three and a half miles long, from Chatham to Rainham, and one from Chatham to Maidstone, a distance of about seven miles. The line from Chatham to Maidstone, the estimated cost of which is £63,555 is to be laid chiefly on private land, and not on the public highway.

Our Office Table.

MR. ROBERT BOYLE, who was the proprietor of over four-fifths of the shares in the firm of Robert Boyle and Son, Ltd., the pioneers of sanitary ventilation, of 64, Holborn Viaduct, London, E.C., and 110, Bothwell-street, Glasgow, having acquired the remainder, the business will henceforth be carried on by him under its original title of Robert Boyle and Son. As the business has always had the benefit of Mr. Boyle's world-wide experience and close personal superintendence, the only change, if any, will, we are sure, be the still greater confidence of its numerous patrons in this old-established undertaking, for the continued and progressive activity of which Mr. Boyle assumes the whole financial responsibility.

MR. WALTER RYE, F.S.A., calls attention to an unjustifiable act of vandalism that is being perpetrated by the Dean and Chapter of Norwich at Bishopgate, at the north-eastern angle of the cathedral precincts. "Fronting Bishopgate and inclosing the lower precinct is," says Mr. Rye, "a fine massive flint wall 2ft. 6in. thick, and probably 600 years old. A great length of this is now being pulled down and a row of red brick villas being erected, which form a terrible eyesore, and constitute a bad foreground to the cathedral behind them. Six houses are to be built, and as the ground rent obtained by the Dean and Chapter is 25s. per house only, the annual increase of revenue to them amounts to the paltry sum of £7 10s. per annum, a very poor equivalent for the loss of the amenities and the erection of a hideous eyesore. Nor is this all, for the Dean has recently cemented over a great piece of the interesting flint house in which he lives, within a few yards of the south door of the cathedral, with brilliant smooth cement, the precinct walls opposite St. Helen's Hospital are still used as advertising stations, and an ugly corrugated zinc fence still abuts on the west front of the Cathedral. That a quasi-public body like the Dean and Chapter should act like this is little less than a scandal." We should be glad if Mr. C. J. Brown, the architect to the Dean and Chapter, can state that Mr. Rye, who is invariably reliable as to his facts and data, has for once been misinformed.

THE London County Council has met the criticism of the Strand improvement design in a courteous spirit, and in addition to postponing for three months the sale of the land which would be required for proper treatment of the street, it has erected on the site several lines of scaffold poles along which have been affixed white bands which show the different lines of frontage proposed. The public can now, on visiting the spot, judge the value of the new proposals, as well as the criticism bestowed on the original design. The best mode for taking in the matter at a glance is to stand on the corner of the pavement at the point where the carriage drive enters the gardens to the west of the Law Courts. From this point the different schemes can be easily compared.

THE Improvements Committee of the London County Council will shortly bring before the Council for approval a scheme for an important widening of Piccadilly on its north side, between Piccadilly-circus and Sackville-street. The Commissioners of his Majesty's Woods and Forests are the freeholders of nearly all the property needed for the improvement, and a satisfactory arrangement has been arrived at between the committee and the Commissioners for the addition to the public way between Piccadilly-circus and Sackville-street of a strip of Crown land necessary to enable the Council to widen Piccadilly to a total width of 80ft., in consideration of the payment by the Council of a total compensation of £200,000, which the committee are advised is a reasonable amount. The improvement is to be divided into sections, and although the Council is to be asked to sanction the scheme as a whole, the only sections that can be dealt with during the next few months are those between Swallow-street and Piccadilly-place and between Piccadilly-place and Air-street, for which the Council is required to pay H.M. Office of Works £95,000. It will not be necessary to obtain Parliamentary powers for the improvement, as it would be carried out by agreement. The Westminster City Council is to be asked to contribute £10,000, one-fifth of the net cost of the widening. A proposal will also shortly be brought before the London County Council by the Improvements

Committee for the widening of Sloane-street at its northern end, between Brompton-road and Basil-street, where the width of the road hardly exceeds 40ft. The scheme is to widen this to 60ft., which is the width of the road south of Basil-street. The cost of the acquisition of property works out at £60,000, towards which the Chelsea Borough Council has offered to contribute £20,000.

THE lectures on Architectural History given by Mr. Banister Fletcher, A.R.I.B.A., and arranged under the auspices of the Board to Promote the Extension of University Teaching of the University of London, held during the past session, have been very successful. The total number of students who entered for the course was 63, and at the examination held at the conclusion of the course 11 students satisfied the examiner (Professor W. R. Lethaby, of the Royal College of Art), and six of these qualified by examination for the Sessional Certificate in Honours. The names of the successful students are: Frank L. Atwell, Arthur E. Colman, *Albert T. J. Harris, John L. Howland, *Frederick G. Pain, Albert A. Reeve, Gerald G. Rogers, *Charles J. Smith, *Ada M. Warren, *Emily M. B. Warren, and *Ernest A. Weston. Those with an asterisk against their names qualified for the Certificate in Honours. The scheme of instruction consisted of weekly lectures (at which carefully-selected notes were given out), illustrated with lantern slides and specially-prepared large lecture diagrams, followed by sketching classes and further explanations of the styles under discussion, which were also rendered more easy to understand by large folio reference books for each style. The majority of students were architects' assistants, pupils, and art students; but a considerable number of students interested in architecture as a necessary part of education were present, especially those who are in the habit of travelling, or who are interested in historical development. An innovation will be introduced during the coming session, which opens at the Chelsea Polytechnic on Monday, October 5, at 7 o'clock, as a series of visits are being arranged to important buildings and museums around London, so that a student may be able to become acquainted with the actual details of architecture, which is impossible to be obtained in a lecture-room only.

THE annual report of Mr. Charles Welch, the Guildhall librarian, states that 4,813 additions of manuscripts, printed books, pamphlets, maps, prints, &c., were made to the library last year, of which 3,300 were donations. The time is not far off when the furnishing of the library will demand serious consideration. At recent sales several volumes of scarce parish registers and family histories and the remaining volumes of Gregory's MSS. collections for the "Lives of the Lord Mayors of London" were purchased. On the demolition of Newgate the museum received as gifts a whipping-post, four chairs from the chapel, iron manacles and waistbands for securing refractory prisoners, and a bust of Sir John Silvester, Recorder of London, 1803-22, who was known among the prisoners as "Black Jack of the Old Bailey." The expenses of the library and museum amounted to £6,575. The art gallery, according to the report of the director, Mr. A. G. Temple, F.S.A., was open 249 days, and attracted 20,872 visitors. During the year the City had received the famous Gassiot collection of 127 pictures worth £90,000. The expenses of the art gallery had been £3,120.

THE Welsh slate industry has found a threatening rival in the British island colony of Newfoundland, where quarries are being worked by American capital and by men hailing originally from the neighbourhood of Bethesda and Penrhyn, Carnarvonshire. Lord Penrhyn and his manager will be interested to learn that the Riga iron barque *Delta* arrived in the Tyne on Friday from Newfoundland, bringing for Mr. John Hewitson, of Newcastle, a full cargo of slates, 870 tons, green and purple, after a smart passage of 21 days. The *Delta* is the fourth vessel to land slates imported from Newfoundland from the quarry which has recently changed hands. This quarry is receiving new and the latest machinery, and wharves have been erected for loading sailing ships. It is expected that the output of slates this year will be treble that of last year, and large quantities, it is anticipated, will be sent over to England. As the Welsh slate quarries cannot supply the demand of the trade, and have raised their prices this year 10 per cent., it is expected in

the codfish colony that Newfoundland slates, which are said to be of excellent quality, will go far towards meeting the requirements of the market.

Trade News.

WAGES MOVEMENTS.

MANCHESTER.—At a mass meeting of Manchester French-polishers, who are out on strike, it was unanimously decided to refuse the masters' terms of 8d. per hour. The men want 8½d. per hour.

SUNDERLAND.—The Mayor of Sunderland, Councillor H. J. Turnbull, has offered to act as mediator in the Sunderland joiners' strike. His worship's letter has been formally acknowledged, but no steps in the matter will be taken until the parties have held further meeting.

CHIPS.

On Sunday a memorial to John Boyle O'Reilly, poet and journalist, of Boston, Mass., who died in 1890, was unveiled at Dowth, near Drogheda, by Father Anderson, O.S.B. The monument is in the form of a Celtic cross standing 14ft. high, with an appropriate inscription in Gaelic. Above the inscription is a marble bust of Boyle O'Reilly, while on either side are emblematic figures representing Erin and America.

A memorial was unveiled on Sunday in St. Peter's Collegiate Church, Wolverhampton, to local men who served in the war in South Africa. The memorial is in the form of a cartouche of veined alabaster, convex on the face, with richly-carved surroundings, the whole being mounted on a slab of Californian onyx. The tablet has been placed on the wall of the north aisle, near the vestry door, and facing the south entrance.

Memorial-stones of a Methodist Sunday-school were laid at Bethesda Chapel, Kynsham, Bristol, last week. The schools will be faced with Pennant stone, with Bath stone dressings, and will measure 65ft. by 30ft. Mr. H. Harding is the builder.

The City Corporation at their last meeting adopted a report of the Improvements and Finance Committee as to the throwing open of the remaining portion of the ground on the north side of Cripplegate Church, with a view to enable that side of the church to be restored and a statue of John Milton erected, on the parochial authorities paying the City £1,500.

Princess Henry of Battenberg opened on Monday the Belgrave Hospital for Children, Clapham-road. The hospital was formerly housed at Pimlico, but has been removed thence and built on the present site, next St. Mark's Church, Kennington-gate. The amount spent upon the building thus far has been £30,000, and in addition to that £4,000 was expended in the purchase of the site. It has been erected from designs by Mr. H. Percy Adams, F.R.I.B.A., of Woburn-place, and was illustrated by a perspective and plans in our issue of August 10, 1900. The elevations are faced with Lawrence's red bricks, with Portland stone dressings.

A fire broke out on Sunday at the timber works and sawmill of Messrs. Meanell, Clarkson, and Co., of Norton, Malton, by which the main building and its contents were destroyed. The damage is estimated at £5,000, the building being insured, but not the stock.

The Mayor of Newport, Mon., opened on Friday a new wing pavilion erected to extend the accommodation of the Corporation Infectious Diseases Hospital at Allt-yr-yn. The cost of this extension has been £10,145, and provision is made for 22 beds.

The Leeds Corporation Improvements Committee have recommended the city council to advance the salary of Mr. Towers, the building inspector, from £350 to £400 a year.

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ESTIMATES GIVEN ON APPLICATION.

LIST OF COMPETITIONS OPEN.

Stonehaven—Additions to Town Hall	George Murdoch, Burgh Surveyor, Stonehaven, N.B.	Sept. 12
Bromley, E.—Public Library	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.	Oct. 2
Rawtenstall—Free Library and Town Hall (Assessor)	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall.	12
Vienna—Machinery to Lift Boats	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Cloverhill—Infectious Diseases Hospital	David W. Shaw, District Clerk, 5, Wellington-square, Ayr.	—
Acton, W.—School (250 places, (Assessor)	B. S. Gott, Clerk to Governors, Guildhall, Westminster.	—

LIST OF TENDERS OPEN.

BUILDINGS.

Walton-le-Dale—Church	Building Committee	John P. Seddon, Architect, The Vicarage, Walton-le-Dale, Preston July 25
Rothie-Norman—Bark House	Wesleyan Trustees	R. G. Wilson, Architect, 181A, Union-street, Aberdeen
Hafod—Chapel and Schoolroom	Guardians	Arthur O. Evan, Pontypridd
St. Neots—Additions to Infirmary at Workhouse	School Buildings Club	S. Inskip Ladds, A.R.I.B.A., Market-place, Huntingdon
Londonderry—Additions to Workhouse Infirmary	Corporation	M. A. Robinson, M.R.I.C.E., M.S.A., Richmond-street, Londonderry
Hull—Classrooms at St. George's-road P.M. Schools	Canon C. Blackett-Ord	T. Beecroft Atkinson, Architect, 11, Trinity House-lane, Hull
Waulwylwyd—Twenty Houses	Aberdeen Commercial Co., Ltd.	R. L. Roberts, Architect, Abercrombie
Cerne, Dorset—External Repairs to Workhouse	Town Council	J. Peacey, Architect, South Walks, Dorchester
Londonderry—Main Entrance to Victoria Market	Rural District Council	The City Surveyor's Office, Guildhall, Londonderry
Rothbury—New Farmhouse at Glebe Farm	Twyn Carno Building Club	W. R. Hindmarsh, Architect, Alnwick
Duffryn Gwaun—Rebuilding Jabez Chapel	School Board	G. Morgan and Sons, Architects, Carmarthen
Peterhead—Premises, Jamaica-street	Rural District Council	Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen
Chelmsford—Library, Museum, and School of Art	Guardians	Chancellor and Son, High-street, Chelmsford
Limavady—Two Cottages, Drumsmurn	Clements and Short	William Crawford, Clerk, R.D.C. Offices, Limavady
Rhymney—Ninety-one Houses	Highways Committee	T. Roderick, Architect, Glebeland, Merthyr Tydfil
West Hartlepool—Upper Grade School (1,200 places)	Devon County Council	Richard Holt, Architect, Liverpool
Rathdrum—Repairs to Two Labourers' Cottages	Aldie & Co. Bridge Tramways Co.	S. G. Gallagher, B.E., C.E., Corballis Castle, Rathdrum
Aberdeen—Farm Steading at Blair of Bourtlee	Urban District Council	L. McKinnon, Advocate, 23, Market-street, Aberdeen
Dartford—Wards and Buildings at Workhouse	Corporation	G. H. Tait, Architect, Lowfield-street, Dartford
Amble—Alterations to Post Office	County Council	J. Wightman Douglas, 1, St. Nicholas Buildings, Newcastle-on-Tyne
Leeds—Additions and Alterations to Offices	Graig Rhymney Building Club	William Bruce, Architect, Greek-street Chambers, Leeds
Exeter—Offices at the Castle	Wesleyan Committee	E. H. Harbottle, County Architect, Exeter
Coatbridge—Car Shed, Main-street	Corporation	The Construction Eng., Brit. Elec. Trac. Co., 1, Adelphi-ter., W.C.
Sale—Cemetery Lodge at Brooklands	County Council	W. Holt, Engineer, Council Offices, Sale
Dublin—Repairs to Marlborough-street Training College	Urban District Council	J. Franklin Fuller, F.S.A., Architect, Dublin
Tiphril—Twenty-eight Houses	Corporation	T. Roderick, Architect, Glebeland, Merthyr Tydfil
Colchester—Tramcar Shed	Parks Committee	H. Goodyear, A.M.I.C.E., Boro' Eng., Town Hall, Colchester
Worthing—Fire Station, &c.	Hackney Union Guardians	Wm. Verral, Town Clerk, Municipal Offices, Worthing
Durham—Education Offices	Elham Rural District Council	W. Crozier, A.M.I.C.E., County Surveyor, Shire Hall, Durham
Newton Abbot—Alterations at Scattered Homes	Ed. H. But, J.P.	Samuel Segar, F.I.A.S., Architect, Union-street, Newton Abbot
Cleethorpes—Lodge, &c.	Borough Council	Egbert Rushton, Engineer, Poplar-road, Cleethorpes
Portsmouth—Discharge Block at Infectious Hospital	Guardians	Alexander Hellard, Town Clerk, Town Hall, Portsmouth
Hull—Park-keeper's Lodge, East Park	Admiralty	J. H. Hirst, City Architect, Town Hall, Hull
Merthyr—Cottage and Lodging-House, Riverside	R. Emmerson and Sons	C. M. Davies, 112 High-street, Merthyr
Chipping Ongar—Children's Homes	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.
Lymington—Coach-House at Sanatorium	W. Ames, Surveyor, Elham	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury
New Mill—Enlarging Tenterbill	H.M. Commissioners of Works	Empsall and Clarkson, Architects, 7, Exchange, Bradford
Esholt—Two Houses	Jacob Thomlinson, Ltd.	J. Bower, Borough Surveyor, Town Hall, Gateshead
Gateshead—Stables, Tyne-road East	Guardians	Joseph Shepherdson, Architect, Driffield
Driffield—Additions to Workhouse Infirmary	Town Council	R. C. Jenkins, Architect, Cefn Coed
Abercrombie—Additions to Shop and House	Borough Council	Charles Jones, M.I.C.E., Engineer, Town Hall, Ealing
Ealing, W.—Slipper Baths, Williams-road	Corporation	John Morgan, Secretary, 68, Robert-street, Ynysybwl
Ynysybwl—Restoring Noddfa Welsh Baptist Chapel	School Board	J. Bower, Borough Surveyor, Town Hall, Gateshead
Gateshead—Stables, Tyne-road East	Pleasant View Building Club	The Borough Surveyor's Office, 15, Market-place, Devises
Devises—Converting Town Hall into Public Offices	Guardians	J. S. Moffatt, Architect, Church-street, Whitehaven
Whitehaven—Rebuilding No. 12, Duke-street	Admiralty	T. R. Atkinson, Architect, Earlston, N.B.
Gordon—Headmaster's House	R. Emmerson and Sons	T. Roderick, Architect, Clifton-street, Aberdeen
Aberaman—Seventy-two Houses	W. Butler	W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff
Glyncorrwg—Rebuilding Nebo Congregational Chapel	H.M. Commissioners of Works	The Clerk of Works, Guardians' Office, Mallow
Mallow—Repairs at Workhouse	Jacob Thomlinson, Ltd.	The Director of Works, Admiralty, W.C.
Hayling Island—Coastguard Station	Guardians	L. H. Armour, 16, West-street, Gateshead
Gateshead—Rebuilding Causey House	Gas Committee	John Gough, Architect, 28, Craven-street, Charing Cross
Walton-on-Thames—Cottage Hospital	Croydon School Board	Peter Frater, Howden-le-Wear
Stanley—House, Mount Pleasant	Bryngoleu Building Club	The Secretary, H.M. Office of Works, Storey's Gate, S.W.
Kew Gardens—Reconstructing Old Herbarium	Steam Laundry Co., Ltd.	C. Eaglesfield, Architect, Maryport
Maryport—Warehouse	G. Bell, J.P.	F. W. Lockwood, Architect, 91, Victoria-street, Whitehead
Whitehead—Two Houses and Shops	Markets Committee	The Clerk of Works, Guardians' Office, Mallow
Mallow—Repairs to Kilsbannig Dispensary Residence	Parish Council	Fletcher W. Stevenson, Engineer, Gasworks, Coventry
Coventry—Sulphate House, &c.	Mrs. Edwards	Barrow Rule, Clerk, Katherine-street, Croydon
Thornton Heath—Schools (1,230 places), Ingram-road	London County Council	W. A. Lloyd, Secretary, 20, Elm-street, Farnham
Ferndale—Forty-one Houses	C. Edwards's Brewery, Ltd.	G. C. Hillard, Architect, Market Chambers, Abertillery
Abertillery—Steam Laundry	L. & N.W. & G.W. Jt. Railways	H. Hobart, Architect, Dromore, Co. Down
Hillsborough—House	Trinity Corporation	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury
Shrewsbury—Covered Cattle Sale Ring	English Wesleyans	J. Cowan, A.M.I.C.E., 179, West George-street, Glasgow
East Kilbride—Cemetery Works	H.M. Commissioners of Works	H. Hill, Dyon Side, Distington
Distington—Enlarging Dyon School	School Managers	B. J. Francis, Architect, Abercrombie
Gilwern—Additions to Corn Exchange Inn	Admiralty	The Housing Section, Archt.'s Dept., 18, Pall Mall East, S.W.
Brickfield Gardens, N.E.—Bandstand, Conveniences, &c.	Guardians	B. J. Francis, Architect, Abercrombie
Gilwern—Nine-stall Stable at Navigation Inn	H.M. Commissioners of Works	A. E. Bolter, Sec. to Joint Committee, Paddington Station, W.
Shrewsbury—Railway Station	School Managers	Corderoy, Selby, and Corderoy, 21, Queen Anne's Gate, S.W.
Portland Bill, Dorset—Lighthouse Dwellings	Admiralty	Arthur O. Evans, Pontypridd
Ynysybwl—Chapel	Guardians	The Secretary, H.M. Office of Works, Storey's Gate, S.W.
Thornton Heath—Sorting Office	H.M. Commissioners of Works	F. G. Beeching, Clerk to Managers, Ashford, Middlesex
Ashford—Repairs to School Roofing	Grove Estate Building Club	The Director of Works, Admiralty, Northumberland-avenue, W.C.
Cemaes, Anglesea—Coastguard Station	Rev. L. P. Williams	P. J. Thomas, Architect, Bridgend
Bridgend—Infirmary at Workhouse	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.
Crewe—Post Office	Hackney Union Guardians	J. W. Grundy and Son, Architects, Brodgen-street, Ulverston
Ulverston—Additions to Cottage Hospital	Corporation	Fisher and Sons, Architects, Club Chambers, Pontypool
Pontnewynydd—Forty Houses	Trustees	Joseph Potts and Sons, Architects, 57, John-street, Sunderland
Sunderland—St. Mary's Vicarage, Tyne Dock	Corporation	Smith and Cross, Architects, Town Hall Chambers, Rochdale
Bacup—Infant's School, Lam-head-lane	Phoenix Brewery Co., Ltd.	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.
Homerton, N.E.—Scullery at Sydney-road Workhouse	School Board	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton
Northampton—Carrs-heds, Workshops, &c.	Misses Cowherd	Anthony and Sons, Anchor House, Kidwelly
Kidwelly, Wales—Alterations to Calvinistic Methodist Chapel	J. R. and John Jacob	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton
Northampton—Power Station Buildings	Phoenix Brewery Co.	Travers and Ramsden, Architects, 44, Church-st., Leigh, Lancashire
Newchurch—Rebuilding Church	Handsorth-Woodhouse Co-op. Soc.	J. Llewellyn Smith, Architect, Aberdeen
Troedyrh—Boys' School (400 places)	Frd Terry	Wm. Hope, Architect, Seymour-road, Hampton Wick
New Malden—Public Offices, Fire Station, &c.	School Board	Ivor James, Registrar, Brecon
Cardiff—Registry Offices	University of Wales	Garside and Pennington, Architects, Pontefract
Gildersome—Wesleyan Sunday Schools	Phoenix Brewery Co.	Wm. E. Gill, Architect, Derby Chambers, Fleet-street, Bury, Lancs
Bury—Offices at Green-lane Brewery	Handsorth-Woodhouse Co-op. Soc.	Gibbs and Flockton, Architects, 15, St. James-row, Sheffield
Driffield—Warehouse and Offices	Frd Terry	J. Robinson, Architect, Park Cottage, Wombwell
Wombwell—School	School Board	Wm. E. Gill, Architect, Fleet-street, Bury, Lancs
Heywood—Alterations at Infirmary Office	Misses Cowherd	John Stalker, M.S.A., Architect, Kendal
Cartmel—Altering House	J. R. and John Jacob	H. Tatham Sudbury, Architect, 18, Market-place, Ilkerton
Ilkerton—Congregational Church and Schools	Phoenix Brewery Co.	Habershon, Fawcoker, and Co., Architects, 14, Pearl-st., Cardiff
Cardiff—Three Shops and Offices	Handsorth-Woodhouse Co-op. Soc.	Robert T. Martin, 7, Wellington-place, Belfast
Belfast—Residing Presbyterian Church	Frd Terry	Wm. E. Gill, Architect, Fleet-street, Bury, Lancs
Heywood—Offices at Phoenix Brewery	School Board	Jowett Kendall & J. Harper Bakes, Architects, Victoria-sq., Leeds
Calverley—Engine-house at Ravencliffe Mill	University of Wales	G. Platts, Manager, Central Stores, Woodhouse
Beighton—Premises	Phoenix Brewery Co.	Jas. Simmonds, Hague-lane, Hemsforth
Hemsforth—Fifteen Houses	Handsorth-Woodhouse Co-op. Soc.	W. Mason Coggill, Architect, Stourton, Hunslet
Leeds—Five Houses and Shops, Harehills-lane	Frd Terry	John Jackson, Architect, Barry-street, Bradford
Westgate—Rebuilding Front of Elephant and Castle Hotel	School Board	F. B. Lewis, City Architect, Guildhall, Nottingham
Nottingham—Board School, Sneinton Boulevard	School Board	

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXV.—No. 2534.

FRIDAY, JULY 31, 1903.

THE SOLUTION OF BUILDING PROBLEMS.

THE problem of how to plan economically and for specific purposes, and to construct on scientific and hygienic principles, is being attacked on various sides by scientific men and experts. Each body of expert explorers is trying to solve the problem in their own way, without any reference to other individuals who are doing the same thing. Thus, for instance, we have the sanitary expert laying down precise and absolute principles about drainage, warming, and ventilation, just as if these matters, important as they are, were supreme, to which all other considerations must give way. He deduces from certain facts and experiences rules which he thinks must be obeyed at all costs. For example, a certain theory of ventilation must be carried out, no matter how it conflicts with architectural design or proportion; the sanitarian thinks, indeed, that plan and architectural features must give way to the rules of sanitary science as understood. Take, again, the mechanical expert, who sees nothing but the design of a building being made to conform to its mechanical equipments, motors—mechanical plant and appliances for certain industries or manufacture; or the structural engineer, whose idea of design is that every portion of a building must be planned and arranged so as to give facilities for iron or steel construction—that the plan ought to be arranged by the engineer to suit the piers and columns, loads, length of girders, and other convenient stock lengths and sections. The engineer's method of solution is one that does not often accord with the architectural sense. He considers every part of the design must be in strict relation to the utilitarian purpose, even if such use compels him to abandon architectural appearances and rules, and to adopt unsightly features and proportions. To the barest mathematical result everything must be sacrificed. Then there is the specialist in a particular branch of architecture, who sees everything with the eyes of one who looks at a building from his own particular point of view, and studies it in plan and elevation to accord with the latest ideas of a theatre, a church, a hospital, a library, or a bath and washhouse. The specialist's idea is rather restricted on this account: he is not likely to take into consideration the conceptions of plan which commend themselves to the ordinary architect, or which, after all, may be better than his own in many respects. The regulation plan is everything, and, according to him, cannot be made mere perfect. Data derived from statistics are closely followed in plan, even where contradictory considerations tell against them. The specialist in fire-resisting construction is strongly wedded to ideas of steel and concrete, to modes of floor and staircase construction which are not generally disputed, and shuts his ears whenever any other system is broached. Thus the advocates of so-called "fireproof" methods cannot bring themselves to acknowledge any value in solid timber construction, however much can be proved in its favour from the fireman's experience. With them it is far more important that there should be cased steel beams and iron columns, metal, lath-and-plaster, or terracotta partitions, and metal sashes and frames, with wired glass, than that these things should be of the usual description found in brick or stone and timber construction. The expert in planning is also inclined to waive points of artistic

value. Considering only the question of plan, he is inclined to neglect the requirements of elevation and detail. In this respect he often, as we lately said, exhibits a want of the sense of proportion in his design. Good arrangement, excellent as it is, can be carried so far that external composition and grouping are lost sight of. No doubt it is a better way of attacking the problem than in the other cases we have mentioned, as plan really lies at the root of good design. The medical man and hygienist is no less exacting than the sanitarian in requiring his special knowledge and clinical experience to be observed. In hospital construction of the latest type we may observe the extreme importance attached to certain details, such as the rounding of all corners and angles between floors and walls, the avoidance of all square angles, edges, or crevices where dust or germs can accumulate in windows, fittings, and furniture; to certain kinds of impermeable and smooth wall and floor and ceiling surfaces, which can be easily cleaned and washed, and in the glazed surfaces of the furniture and plumbers' fittings. These requirements are certainly inimical to the art sense. A hospital ward, as sketched by Mr. Saxon Snell in his paper read at the Bradford Congress of the Sanitary Institute, is a bare and almost painful example of modern sanitary science as now understood by the medical profession. Other instances of solving the problems of modern building by scientific methods may be mentioned; but they all leave something to be desired not dreamt of in the philosophy of science. In the design and construction of buildings like hospitals, workhouses, labourers' cottages, and other institutions of an official and administrative kind, we owe much to the study and statistical researches of experts. Economy of construction and plan, and the conditions of health and safety against disease and fire have been promoted by their aid. Science has formulated methods of construction which cannot be disputed, even if they are not the most perfect and convincing from other points of view, or even, as they often do, set art at defiance. On these points there is something to say. Have these various solutions of modern architectural problems been of value to the art? Have they helped to improve architecture?—have they evoked any corresponding feeling for art? Has the artistic mind been responsive to scientific specialism? These are questions that largely rest with the profession. In each of these different ways valuable results have been obtained, but the general effect has been sometimes disastrous. Each of the many problems of municipal building has been attacked from one side only—the utilitarian or scientific, leaving the other sides of the problem untouched, and thus while it is true that many useful improvements in plan and construction have been made, the effect on each class of building has been to produce an imperfect and ill-balanced whole. The scientific and technical elements have been developed at the expense of the æsthetic. From the materials used in the walls, floors, and roofs down to the smallest detail of fitting or equipment, there is the stamp of utility. Everything is moulded, cast, and turned out by machinery: the locks, fastenings, gas and electric fittings manufactured for our buildings are perfect as contrivances for the end in view, but they are often inartistic. The stamp of commercial utility is on everything, even the decorative. The architect is powerless to do more than select the most suitable: he is unable to introduce his own views or any artistic reform. The expert in scientific construction or plan, has no inclination to study other sides of the problem. Thus we may instance a hospital pavilion, a working-class dwelling, or a technical school, or public baths;—the men who are at the head of their vocation in these matters have not the opportunity of cen-

sulting eminent art architects to assist them in giving expression to their plans—in fact, if he troubles at all about the design, he employs an artistic draftsman to carry out his views. It is impossible that one man can grasp the whole problem in its many-sidedness; but it is possible that the scientific expert may obtain the assistance of an artist who has some acquaintance with the particular class of building, and that their co-operation may be the means of producing a design more worthy of the object. Co-operation in design is one of the ways which we think it is possible to overcome the evil we have mentioned. The designs for buildings of a special class intended for labourers' dwellings, hospitals, schools, and the like, would be relieved of a good deal of their unsightliness, bareness, and want of artistic treatment if they passed through two instead of one set of eyes. We should not see so many crude buildings erected for these purposes, or for any utilitarian object, in which the only aim has been to satisfy certain requirements—to provide the bare dimensions and regulation patterns of Government blue-books and departments, without any attempt to make them agreeable to our sense of artistic propriety. The bare engineering structure is a case in point. The engineer scrupulously follows the depths and sectional areas of his beams and columns and roofs, but does nothing to make them pleasing or architectural. If he were associated with an architect who had mastered the actual wants of the building, had studied ironwork, the result would be different. Many of the little amenities of design would be observed, proportions readjusted to meet architectural rules. Internally, instead of a chaos of materials and fittings juxtaposed without any feeling or sympathy, such as mahogany partitions "scribed" to the contours of plaster cornices, and terracotta details; of iron columns abruptly terminating against an ornamental plaster ceiling, and all kinds of ill-assorted fittings, we should get more harmony and architectural fitness. One American writer on the subject of the design of the modern office building, discusses the qualifications necessary in the designer-in-chief of these buildings where there is so much of the engineering and technical. He says: "A type of mind unsuited for the position of designer-in-chief is that type which has no appreciation of art and beauty, and has no other measures than those of economy and efficiency." Such a mind "misses the best solution, or possibly never attains it, in a problem of this character, by the narrow view it takes of the things with which it is not familiar, and by reason of one-sided training is not fitted to be an intelligent and impartial judge of the various elements entering into a composite and complex design. The designer best qualified for this important position is evidently one who has a knowledge of the broad essentials and limitations of the various parts of the design, the judicial temperament permitting the balancing of an advantage against a disadvantage; a breadth of mind enabling a comprehensive view to be taken, coupled with courage and decision, with all these qualifications governed by a broad and catholic love of beauty in all its manifestations—not only of beauty of form and line, which is evident and can be comprehended, but of the more subtle beauty of science and its results." Such a combination of qualifications is seldom realised, except in a few rare instances, as in the engineer or architect whose knowledge of facts and laws is accompanied with a broad knowledge of the fundamental requirements of art. The same writer, in analysing these engineering-architectural problems, says that a building of this kind is seen to admit of two main divisions—(1) the engineering design; (2) the architectural design. The first comprises all the structural and mechanical components,

which include the foundation and superstructure, the stability against vibration and wind, resistance to fire and corrosion, also the planning of the floor areas and their subdivisions, supports, the position of lifts or elevators, lighting and heating systems, fireproofing and rust-proofing. The second division is made to include the treatment of the façade arrangement of the windows and internal treatment of the offices. The architectural part of the work, he goes on to say, admits of a number of ways of solving the problem. Without materially affecting the structural or engineering design—that is to say, if there is only one structural solution—there are numerous architectural treatments possible, and therefore the chief aim should be to fix upon the engineering structural solution first, and make the architecture conform to it. It is to find the right architectural treatment that is necessary. This argument may be open to question with those who believe there is only one possible architectural treatment for every building, and who deny that architectural design is something elastic, and can be fitted to suit any building. But if we make structural arrangement the basis of architecture, there can be only one treatment that is conformable to it. Directly we consider the engineering structure distinct from the architectural, it does not matter in what way we design the building. According to the twofold division we have given, the American author adopts the latter theory. It is not the most satisfactory, but it practically illustrates these remarks. An architectural problem attacked on the engineering or utilitarian side, as we have imagined, does not give much hope of a satisfactory solution. The artistic side goes begging, or is neglected altogether. In short, the solution is only a partial and incomplete one; and it is so seldom that one man, an expert, combines both his own and the artistic sides of his vocation, and if he obtains assistance, it is generally from one who has no sympathy for the particular object of the building. We think the latter is the most usual. Architectural specialists do not as a rule co-operate together. They are more likely to consult with men who know little or nothing of their particular business. The result is there is a want of sympathy between the plan and external design, between the motive of the designer and the practical details. Harmony is out of the question. In our large commercial buildings, warehouses, our residential blocks of flats, the monster hotels in the Strand and the West-End of London, we find this lack of harmony between the design of the architect and the crafts of the engineer, the furniture manufacturer, plasterer, the keramist, and the metal-worker. It would be needless to mention all the kinds of incoherence and conflicts we see; the disagreement between the architect's scheme of design and those of the decorator, ceramic artist, wood-carver, and upholsterer. The style, mouldings, and details of the architecture are nowhere in complete agreement with those of the woodwork, the ceramic wall decoration, or the gas and electric-light fittings. One thing seems to jar on the other; there is a want of completeness and finish everywhere; between the joinery and plasterwork; the mouldings do not properly unite, or are quite different in section. The connections of ironwork, the girder connections with the columns or stanchions, or the junction of iron and stone or brickwork are often grossly defective. Between the architect and carver or sculptor there is often a want of correspondence or harmony; their methods are not the same—each has been inspired by a different motive, and there is a want of affinity seen between the decoration and the design. Very often the artistic crafts have discerned the motive of the design, while the general designer has been ruled so entirely by his own object that no amount of

correspondence is possible between them; they are working on totally different lines, and appear not to see what is really wanted. Each has a great deal to learn from the other; but this is scarcely likely to be brought about by the present attitude of the crafts. The architect must cultivate a knowledge of other professions and trades; he should see the danger of not learning something from scientific requirements, from medical, sanitary, and artistic sides of the problem, so that it may not be worked independently from the outside to his detriment. So often a new movement is set up, and every new movement is a proof that something more is required than mere conventional usage, and if it is not recognised in time and accepted with a good grace, a profession springs up and appropriates the new idea or system to the disadvantage of the older profession. So it is that the present utilitarian or structural view of architecture is really a reaction from the meaningless reproduction of Classic and Gothic of the last century; but its value may be overestimated, and it is necessary to recall other views or elements that are equally important for a healthy architecture. The structural and utilitarian basis of architectural design is one that may become heartless and intolerant if not restrained by these considerations.

REGISTRATION.

THE resolution passed at a special general meeting of the Leeds and Yorkshire Architectural Society, in response to an invitation from the Royal Institute of British Architects that the allied societies should express their opinion on the registration of qualified architects, is noteworthy, a remarkable proof of the architectural mind on the subject, and a complete answer to those in the profession who would prefer to close the doors on all practitioners who are not members of the Institute. We gave the resolution last week, which ran as follows: "Resolved that, in answer to the request of the President of the Royal Institute of British Architects, this meeting of members of the Leeds and Yorkshire Architectural Society, allied with the Royal Institute, expresses itself in favour of the 'statutory registration of qualified architects,' and expresses the hope that the Royal Institute will take early measures to give effect to a principle which would give our profession a recognised status, and raise the standard of architectural education and training throughout the kingdom." Here in a few words we have the outcome of all we have been fighting for for the last twenty-five years or more. The profession, both here and abroad, have, with few exceptions, agreed to the principle of registration as the only plan that will protect the public from unqualified practitioners and the profession from the admission within their ranks of incompetent men, who now overwhelm the craft. The arguments against the registration of architects have chiefly proceeded from those who have attained lucrative practices, and who are not anxious to see the present condition of things altered, and also from those who pose as the leading art representatives of the profession, and who have won the distinctive titles of a Royal Academician or an A.R.A., and who think the highest positions in architecture will be imperilled by registering everyone who is competent irrespective of his artistic abilities, that art would suffer by being made an obligatory subject. Their opposition to the movement is chiefly from an art point of view. They imagine that any system of registration for architects would be to rob the profession of its artistic prestige, and they deny that any examination can confer any high art qualification—the latter view, indeed, very few persons would care to contradict. But the inconsistency of this attitude towards

the question we have pointed out. One or two well-known architects who oppose the movement are Royal Academicians; but, as pointed out by Mr. Seth-Smith in his able and conclusive letter, that very select body of artists "imposes an examination to ascertain if a man is artist enough to profit by its course of instruction in its school of art, and it actually registers by the distinguishing title of A.R.A. or R.A. those who do so profess." Nor do we hear of academicians suffering from these examinations. Again, the same writer shows that the Royal College of Art, which trains professional teachers for the art schools, imposes entrance tests and examinations. And the same argument applies in other cases. The universities of Germany and America have organised architectural courses, and degrees are provided. We will not at any length discuss this question again from the two points of view we have named. Those who have won positions in the profession by individual exertion and ability, and who desire to keep the doors as close as possible, should be the last men to raise any objection to the scheme, and it savours a little of narrowness to try to exclude those who on the essentials of their art have proved their ability. It is too much like ascending the ladder of fame, and having reached the topmost "rung," kicking it over that no one else should have a chance. On the second plea, that it is impossible to examine in art, more might possibly be said. We do not deny that it is impossible to make an artist by examination—that is, to implant in any candidate the art instinct and power; but one can surely test his powers as a designer. A prescribed course of art instruction sufficient as a minimum is surely not to be ignored; it cannot do any possible harm to those who have the natural gift. But for the Institute which has for many years adopted and applied the principle—viz., "that it is possible by an art, as well as by a science test, to ascertain a man's aptitude to follow architecture," to denounce a course of instruction or a test of proficiency in art is amazing. Nor does anyone dispute the fact that registration will not prevent disqualified persons designing the erection of buildings. The average citizen is free to engage an unqualified practitioner if he likes, just as he can select a quack in medicine to prescribe for him. In fact, the public are often perverse on these matters; there are many people who object on a kind of principle to follow any orthodox creed, or to employ a regular medical practitioner. They prefer to take quack medicines, any patent medicine which has been puffed up or recommended by a friend, without considering the mischief it entails on their health, and that what may do for one is not safe for another. And it is precisely the same in architectural matters. There are many credulous people who believe that a design drawn by a builder or his clerk will do just as well, if not better, than a design prepared by a qualified architect. The Medical Act has not suppressed quacks, and we do not expect that a Registration Act for architects will keep out incompetent men; but the Act will at least distinguish or "hall mark" the qualified, and put the public on their guard. Of one thing we may be certain: every succeeding generation will discover the advantages of the measure, and the standard required will be raised. And the public will soon begin to discern the advantages of securing the services of men who have a proper training rather than those against whom they would have no chance of redress for negligence or incompetence. Others, again, have urged that it would be a wiser and more practical step to secure the registration of builders as the only protection against bad building; but, as Mr. Seth-Smith has pointed out, "it would be like registering chemists and leaving the medical profession full of

charlatans." Little would the "registered" builder care if the design was full of defects of plan and construction, so long as he carried out the architect's plan in a workmanlike manner. The builder would not care to interfere with the architect's design, though the chemist would hesitate to risk his business. It is asserted that sanitary construction and scientific building are matters that are so well provided for by sanitary and district surveyors, as the officials of municipal authority, that therefore it is unnecessary that the profession should be qualified on these matters; but such supervision would be no guarantee to the owner that the regulations were carried out in a perfect manner without personal inspection. The support given to the Bill before Parliament, instituted by the Society of Architects, has been largely supported by the profession in all the influential Colonies and on the Continent, where similar legislation is provided. And amongst our leading members of the profession there has been a reconsideration of the scheme. Many of those who strongly opposed registration are now enlisted in its favour, and in the Institute itself, the stronghold of opposition to the Bill, there are signs of an awakening. The greatest proof is that many of those who failed to secure seats on the Institute Council were strong opponents of the measure, as we lately showed in the results of the election of the new Council, while Mr. Seth-Smith and many others, who have fought the battle gallantly, have been re-elected. These facts indicate at least that there is a change of opinion and feeling with regard to the measure. A higher standard of education and training is demanded, and it is now seen that such a standard will not be reached if the examinations are optional. To raise the standard of efficiency can be done only by a compulsory measure, such as that proposed by the Bill, in which a minimum of qualification will be required of all those who practise the profession. For a long time the question of a voluntary or a compulsory training has been discussed; even now there are some who think such a profession as that of the architect ought to be left to the student himself; but the general impression is certainly that nothing practical will be accomplished unless every architect who practises is called upon to show his capabilities in the elements of his profession, and this can only be done by statutory registration of some sort. As to its being made to include art culture there are still differences; but, as we have shown, they are gradually disappearing before the sounder views that now prevail. The Royal Institute is the right body to carry out the measure, if it can get rid of those traditional prejudices which have hampered it so long. As new and younger blood is being introduced, we may look hopefully to the change of front which is now apparent. The resolution passed the other day by the affiliated architectural societies in Yorkshire is a reflex of the opinion of all qualified provincial practitioners, who now regard the chaotic condition of the profession as prejudicial to the employment of architects by the public. Registration of competent men would be a great protection to both, and the furtherance of the interests of good building.

NATIONAL COMPETITION DESIGNS AND DRAWINGS.

THE annual exhibition of designs and works of the various schools of art, evening classes, and day classes has now become a very important record of the progress made in art during the year. From the numerous schools of art, branch schools, science and art evening schools no fewer than 5,722 works were entered for competition. The gold medals number only four, and are taken by students from Battersea

Polytechnic, Birmingham, New Cross, and Taunton. We are sorry to find that this medal is not awarded for any design of an architectural or decorative character. The recipients are three lady students, who send designs for printed muslin, lace, and silver brooches and clasps, and one male student, for model of a figure from the nude. Out of the 69 silver medals only one has been awarded for any design of an architectural subject. The examiners of the designs and architectural drawing, J. Belcher, A.R.A., Reginald Blomfield, and T. G. Jackson, say they are much disappointed with the showy work in this class of study (design), and have rejected a number of rudimentary and incomplete designs which should never have been submitted for the competition, and they regret that in many cases the mistakes made by the students show a want of intelligent instruction on the subject. The above remarks are not very encouraging to the profession. As the designs are not all exhibited it is impossible for us to "go behind" the opinion of the judges appointed; but we are afraid there is some truth in the opinion expressed—that this subject has not received the attention and study from those who instruct which its importance demands. We have before now drawn attention to the selection of subjects—some ambitious or simply so academical that they have no practical value for the student, others serving to display draughtsmanship rather than principles of design. One award of a silver medal is made to a student of the Regent-street Polytechnic for a set of drawings of the Hall, Eltham Palace.

Beginning our notice with the architectural designs, we find the examiners have awarded a silver medal for a design for an oak reredos and baldachino, by John H. Gibbons, of Manchester (Cavendish-street School). There is no question about the merits of this design, and the examiners say if the design had been accompanied by working details it is probable that a gold medal would have been awarded. We believe the merits of the design and its evidence of skill in the details given fully entitled it to this distinction. The plan shows an apse for the high altar raised seven steps above the choir, with rather flat canted sides, and the roof pointed in shape, groined in wood and panelled and gilded. The design for the reredos is feelingly drawn, and is of a Late or florid or Flamboyant Gothic character, freely treated, and slightly tinted. The centre compartment over the altar is the Crucifixion, with the kneeling figures; and this portion is carried up and ends in a rich, level, pierced parapet, and flanked by turrets. The details are masterly, and show a thorough knowledge of good models. Certainly the design by Frank Jones, of Scarborough, for a town mission church and hostel for a religious order comes next in merit, and deserves a bronze medal, though only a book prize is given it. The vaulting is certainly not very clear; but this is a detail which can be got over. The church and its adjoining mission house are in red brick, simply and broadly treated with much picturesqueness, on sloping ground. The roofs of slate make an agreeable colour contrast, and the massive tower of red brick, which breaks the composition nicely, is terminated by an open brick lantern supporting a central brick shaft or spirelet by open buttresses at the angles. The plan shows knowledge of the requirements. A bronze medal is given also to Harry A. Dickman, Nottingham, for a design for a town church in a Classic style, with lofty tower or campanile crowned by a cupola over the west entrance. The plan has a centre vestibule, with vestry and baptistery at the west, and a nave and two aisles divided by coupled piers and pilasters of the Ionic order; a choir and clergy vestry at the north side of choir, a morning chapel on the south side, and an apse with semi-dome over. A circular ribbed

and panelled vault covers the nave, which is partly lighted by clerestory windows hidden behind a parapet carried up above the aisle roofs. The drawings are firm and show good detail, and a solid rusticated treatment externally is given. This is certainly one of the best designs hung. A design for a country house is a popular subject. Athelstan Iredale, Gloucester, shows local stone for the walling, with a yellow stone in dressings of windows, &c., and rough-cast above. The style is plain, sensibly treated, with mullioned windows and red tile roof; but no plan is seen. Another design, by S. F. Parsons, Nottingham, adopts an Elizabethan style. The plan is fairly good, with projecting kitchen office wing on the north-east side, and there is a symmetrical main front on the west side of house, with bay windows to the drawing and dining rooms at each end. An open loggia forms a feature between. A book prize is awarded to each of these. We prefer the student to take a simpler style than the last; the choice of expensive styles should be discouraged for this class of work. A design for a village club and entertainment hall, a good subject, secures the same prize. Herbert Rainger, Gloucester, adopts local stone for walls, with rough-cast above and red tile roofs, with half-timber constructionally used on the gables, &c. Without the plan we cannot judge of the merits of the design. A design for a provincial bank in a rather heavy style is sent by a Leicester student, Harry W. Meech, receives a book prize. The design for town-hall, by G. H. T. Robinson, Wolverhampton, is a theme too pretentious in kind for the student whose architectural knowledge is not quite equal to the effort. The entablature is faulty in proportion of frieze, and the plan, with open court in centre, is quadrangular and defective in arrangement. The corner cupolas are also meagre, and the tower over centre vestibule is weak in detail. The design for museum and art gallery, by A. Halstead, Burnley, is also a subject far beyond the capacities of the art student. A good general idea is spoilt by the architectural details, in particular by the coupled pilasters carried on pedestals, which rise between the lower windows and have a weak appearance. The plan is symmetrical, with two large museums as wings, and a larger central hall and staircase than necessary. The design for chancel screens by Charles Green, a Birmingham student, receives a bronze medal. They show a knowledge of framing, yet the designs hardly merits the prize if we compare relative merit. The cross carried on a carved corbel over the entrance on No. 2 is weak. Decorated pierced tracery is shown in the other design in oak.

The architectural drawings from measurements are few, and the selection is less satisfactory, though the examiners say the general average of work compares well with that of last year. A silver medal is awarded to Percy Ion Elton, of Regent-street (evening school), for his fine set of drawings of "The Hall, Eltham." They are in ink, and remarkable for the neatness and care of execution. This set was awarded a first silver medal at the R.A. competition of 1902. The example is a good one, and the noble timber roof has become an historic example worthy of all architectural students' efforts. Harold S. Sawyer, Winchester, obtains a bronze medal for his measured drawings of the Castle Hall in that city—noted for the King Arthur's round table. The building was originally Norman, but is now mainly Early English. The same prize is awarded to Bryant Alfred Poulter, Reading, for his exquisitely drawn plans and elevations of "The Forbury," Reading, a fine example of an old brick residence of the 18th century, with its two bay windows and flat-gauged arches, now used for offices by Messrs. Ravenscroft, Son, and Morris, architects, and Messrs. May, solicitors. There is a large

sheet of details of mouldings and the fine old staircase. The colouring of the elevations is of the proper depth of tone, but looks rather heavy in a drawing. The remark of the judges on the use of broken lines in drawings of this kind may be useful: they are too often substituted for the fine line with less accuracy. A bronze medal is also given to Annabelle Runciman, Aberdeen, for measured drawings of a carved oak screen in King's College Chapel in that city. The drawing is in fine pencil lines with details. A book prize is given to John D. Forbes, Inverness, for his large measured drawings of the steeple of church in that city—a Classic steeple; to Christina Corbett, Carlisle, for drawing of a screen between chancel and north aisles in the Cathedral; to William E. Sands, Nottingham, for his pencil drawings of chancel screen in All Saints' Church, Strelley; also to Sidney R. Day, Leeds, for measured drawings of oak screen in St. John's Church, dated 1633, Elizabethan in its features, and another book prize to F. Goldsborough, Birmingham, for drawings of porch to Berkswell Church—a fine pencil drawing. In some of these drawings there is a desire to emphasise detail with thick lines, a device that cannot be commended for drawings of this kind, and the remark of the examiners about the mistake of outlining ornaments with thick lines is justified.

Internal decorative designs are an interesting feature of these exhibitions; this year the work is fairly good. A silver medal goes to a Chelsea student, Bertram Payne, for a design for a hall in the style of Francis I. There is evidence of study of the period—a stone corbelled chimney-piece, screen and door of wood. The design for coffered ceiling and the cabinet are well drawn. Arthur MacKinder, of Lincoln, has a design for the decoration of an ante-chamber to the state apartments of an Egyptian Governor, a very delicate treatment in tints of white and gold. The doorway and panelling, drawn to 2in. scale, exhibit knowledge of detail; the woodwork is painted white, the parts in relief to be glazed; the frieze and wall filling to be stencilled on linen. The ceiling and stencilled frieze are cleverly executed, and the design is well worthy of the silver medal awarded to it. Louise R. Jacobs, Hull, receives the same medal for her design for a nursery overmantel—a very able design, exhibiting simplicity of conception and grace of fancy and nice sentiment in the charming little maids dancing under trees, with lamps held up by old men on the branches. The blue and green tints are nicely harmonised. A design for a stencilled frieze and wall filling, by David Hodge, is clever, and takes a silver medal. The designs are in white or grey and zinc, a silvery metallic lustre on the brown ground. The same award is made for a plaque, in which graceful lines of figures and swans are represented, with a border of swans sgraffito. Also for a vase executed in sgraffito and coloured "slips." Margaret Annie Smith, Stoke-on-Trent, receives this medal for a very beautiful design for plaque, with sgraffito ornament, displaying much invention and charm in the whirling lines of figures round the centre and border. Chas. Connor, Hanley, takes also the prize for his designs for pottery panels for wardrobe and music cabinet. The woodwork is exceedingly simple and well treated, with well-drawn figures. The music cabinet, in framed oak, with pottery panels, on sgraffito, is clever. Herbert Budd, Hanley, is a recipient of the prize for designs for pottery panels for a fireplace. The work is simple and broadly treated, the sketches for panels in coloured "slips" with sgraffito outline under glaze, the whole dipped in a toned glaze and fixed in the woodwork exhibit skill and imagination. On the same wall we notice a clever design for a sundial in pottery in majolica glaze, by Joseph Finney, of the same school, and an executed example. A corbel

executed in coloured majolica glaze, by G. Brain, Hanley, receives a bronze medal. The design for dado tiles, by J. Skinner, Burslem, shows skilful arrangement, and we must notice also a design for a mosaic pavement and frieze by Thos. Cook, West Ham, exceeding able in the motive. The peacocks introduced in the design and border of pavement are nicely arranged, and the frieze in Venetian glass mosaic with figures of maidens introduced in a sort of Vitruvian scroll, is pretty in device. The designs in stencil are often too intricate for this process, which should be to repeat a simple pattern. Many of the stencilled designs are a violation of this principle. The designs for stained glass show an advance in adaptation and arrangement. Ida L. Kay, Birmingham, sends designs for windows in which the composition is decidedly clever. The silver medal goes also to James S. Alderson, of the same place, for very clever glass panels, one with three graceful figures introduced, simple in conception; also to Joseph Sanders, of Birmingham, for glass with a design, "Beauty and the Beast." Florence Camm, also of the same school, exhibits design representing St. Nicholas and the restoration to life of three children. Several other designs for furniture, decoration, metal-work, stained glass, and those for modelling deserve notice. To these and other subjects we may refer next week.

"BUILDING NEWS" DESIGNING CLUB.

A WAYSIDE TAVERN AND TWO COTTAGES.

THIS is an eminently favourable subject for the display of capabilities in the direction of the picturesque which naturally embodies the ideal of the young architect whose enthusiasm, when associated with an artistic temperament, may possibly run riot at times, and result in extravagances. The more prosaic student, hampered by a consideration of the practical and evident limitations of everyday affairs, is apt to smile at such exuberances with which he has but little sympathy, though, after all, there is by far too little poetry in life, and without enthusiasm no living art is possible. In setting this competition we had in view the realisation of such an ambition among the members of our Club, and we are keenly sensible of the priceless value of a well-directed enthusiastic sense as an essential factor in all matters connected with successful design. The imagination must be cultivated and afforded an incentive to action, though it is also manifestly true that the possessor of real genius, more or less in degree, will sooner or later impress his gift upon what he does, and will not fail to create his opportunity. The Building News Designing Club encourages the trial of conclusions with others in open competition, as a healthy rivalry for mutual improvement amongst men living far apart in all quarters of the country away from the Metropolis more than likely, and for this reason and in other ways precluded from joining architectural classes. We generally endeavour to make a choice of subjects which are calculated to assist the student in the practical solution of contemporary problems likely to come within the scope of ordinary practice, and in which the chances for the exhibition of picturesque freedom are correspondingly restricted. The design, therefore, of a country public-house, with a post-office and cottage situate at the corner of some rural goosgreen, was advisedly chosen in the hope of bringing out more particularly those artistic qualities which should insure a suitable and pretty result. This intention needs only one qualifying remark, which is this: that there is no more deplorable exhibition to be noted in a study of architectural design than the painful failure which is inevitable when a designer consciously sets to work to produce a picturesque composition without recognising as a leading principle that such a result can only be obtained as a natural sequence upon the practical conditions for which his structure is evolved. Of course, it goes without saying that the picturesque is a matter quite apart from petty details and the frills of foolish ornament. It is also an essential of the picturesque that it should be unconstrained, and sweet in line as well as in

proportion. How, then, have our competitors risen to this ideal? The answer can be obtained by a reference to their designs, and here, as in all questions of taste, our readers will form their own judgment. We place "All British" first, "Solo" second, and "Whone" third. We give the conditions issued for the use of competitors:—

A Country-side Tavern and Two Cottages, one being the post-office. This group of picturesque little buildings will occupy a corner site, overlooking a goose-green and facing south, the land being flat. The "pub" is to be at the corner, with a draw-up place for carts with horse-trough, and sign on a post standard. The accommodation of the tavern to be a bar and bar-parlour, with a smoking-room on the other side of the passage, which is to lead through to the yard in rear. This house, like the other two, is to be on two floors, with a kitchen-living room and a small sitting-room and four bedrooms and offices. The third house, which will be the post-office, is to have a shopfront for that business. The two cottages to have front forecourt gardens, 15ft. deep, with white painted wood palings. Walls roughcast on a brick base 7ft. high, particularly where the walls will be subject to rough usage by wear and tear. Roofs covered with thatch. Windows to be double-hung sashes, save to little offices, where casements will do. The staircases must be economical, but prettily contrived and well lighted. Ground-floor rooms 9ft. high, upper rooms 8ft. 6in. The width of the whole frontage is 100ft., and no limit of depth. The living rooms to be 14ft. by 12ft., square kitchens 12ft. by 12ft., or thereabouts. The tavern to be of similar proportions, the bar parlour being 20ft. by 14ft., the greater size to be out of the depth of the site. Scale 8ft. to the inch; sufficient drawings, including a small sketch view.

"All British" has somewhat cleverly imitated old vernacular cottage building, and avoided the modernised methods of roughcasted, thin, and cheap picturesque building which for a few years has been in vogue, with sloping buttresses, red chimney pots and blinds, set off by green-painted woodwork. The broad unbroken eaves line of the thatched roof, and the big, plain chimney stack, give dignity which comes of simplicity. We are not quite sure that the weatherboarded gable is an advantage. Plenty of precedents could be found no doubt, though sometimes the boarding has been added in aftertimes to exclude driving rains on the gable walling becoming faulty. The plans are fairly good, though open to criticism in parts, such as the corridor on first floor of the tavern where it would be none too light. "Solo," the second man, lacks the breadth which the first design illustrates. The return front of the tavern would look very well; but the idea of the bar arrangement is more in accord with the everyday public-house type with its glazed bars, and we much prefer the more unambitious open counter arranged by "All British," which is more in harmony with country-side needs and hospitality. The post office is less cramped, and the cottage belonging to it has a separate front entrance, whereas in the first-placed plan the only other entrance is through the kitchen, unless the post-office door is used for the house, which would hardly do.

"Whone," the third design, differs in the main entirely with the other two. It is a much more involved affair seemingly at first sight, on account of the peculiar mannerism of the draughtsman, and by reason of the tavern part being carried back just as it is. "Whone" does himself an injustice by such drawing, and he is too pretentious in minor matters. It would be so much simpler and better if he would be less affected in his style, while his plans (which are not devoid of ability and inventiveness) would be clearer and more easily read if they were drawn properly. References to haunted guest-chambers are in their way very well; but, after all, we have to deal with building work and materials as well as plan for everyday uses. The barnmaid's place and the bar standing-room are quite inadequate and cramped, close as they are up to the front entrance. The service to the bar-parlour seems to depend entirely on the kitchen, seeing that the passage-way comes between the bar and the parlour.

"Four Point Seven" ranks fourth with a design which lacks simplicity, the front of the tavern being its best part, though the plan is disconnected and poor. With such a record it may be wondered why we place him thus in the competition. We do so on account of his general merit and style of drawing, also for the way in

which he has arranged his subject on the sheet. He must not take too much credit, however, for this, as in our judgment he ought to have done better. For one thing, his staircase would not give head room below for the space he has shown available on the ground floor. Domestic architecture of this elementary kind is spoiled by too pronounced vertical lines. "The Last Man In" has made a bold stroke at originality by disposing his tavern on plan with a crescent-shaped curve to form a "court yard," as he terms it, in front of the archway leading to the yard at the rear. It is not, however, a success. The effort is too manifest, and by dividing the arrangements in this way we get a much more ambitious type of inn than what was contemplated. Externally we note no little ability displayed; but thatched roofs do not accommodate themselves to parapets structurally, and artistically the combination is not pleasing, because it looks wrong. "Brassey" puts projecting angle-set bays to his tavern, which, under some circumstances, looks very effective with gables running diagonally into a main high-pitched roof. His plan is very poor, with a central octagon by way of a hall crowded up with a staircase. His cottages are good in planning, though no extra room is provided for the post office, so that this house is one room less than the other. "Vectis" has the same objection, and by separating the cottages from the tavern also takes away one of the leading advantages open to the competitors to get an effective group. The roughcast gabled first-floor sits in an ungainly fashion on to the arched central door of the tavern, and the roofs are too sharp in their pitch to look restful and pretty. "James," too, cuts up his design too freely, and fails to realise the homely merit of repose. Possibly in execution his scheme might look better. The drawing is crisply handled, but impresses one with an overdone appearance. "The Kid" is ambitious and ingenious, setting out his public-house on an inverted V-shape, the bar being in the midst, with smoking-room and bar-parlour right and left. It is a clever plan, but uncomfortably quaint, and so dark in its rooms. The smoke-room has a minstrels' gallery, which would not be very conducive to good music under such conditions, and, besides, the whole thing is too small for such contrivances. The style is half-timbered and odd. "Viking" adopts, too, this same style of work; but he introduces a tower with a domical top in thatch. His post-office is a shop wedged in between the two cottages somewhat effectively, though it has the appearance of having been cut into the façade subsequently to the erection of the house. "Icicle" is, for him, a long way down in this list. His design has a thin look, and his pub is wasteful in passageways. "Pan" sends a well-executed pen-and-ink view deserving of praise; but we cannot admire his design, which has a pinched look on plan in the tavern, principally due to the narrow passage and poor entry. The bar-parlour is better, but the house does not adapt itself nicely to a corner site. "Muggins" is a long way behind the last named. "Tenderfoot" should not colour his elevations, and is referred to the rules. He is a new competitor who ought to come to the front. At present his plans are very weak. He should study stairways. "Lactrea" is neat: he sends a square sort of public-house, which is quiet and suburban-looking, but not suitable for a country goose-green. "Inside Right" comes next with a plain and simple proposal, which is drawn thinly. "Hurry" also is thin in his draughtsmanship and toy-like in his design. "Spes" and "Ogee" conclude the series.

ON BUILDING TIMBERS.—XXXII.

HARDWOODS, FANCY WOODS.

THOUGH, with the exception of oak, mahogany, and teak, these woods do not enter largely into building work, yet as they are frequently placed on the market here with soft woods, and are occasionally used in decorative work, a short account of each is given, as there is a tendency to use ornamental hard woods in some of the best modern buildings where the nature of such are at all well known. There are a few rules which may be laid down for the guidance of those who intend to employ woods with which they are not familiar in joinery. All framing should be of straight-grained wood, free from knots; the wood should also be straight

grown—that is, free from twist in the log. In many logs the slight cracks due to drying (which are seen on the sides of most hardwoods) may run in lines parallel to the corners of the log from end to end; but in some this "checking," as it is called, may be seen to run obliquely across the faces of the log. The tree from which such a log has been cut was twisted by prevailing winds in growing, and it should be rejected for framing of any kind. Figured or wavy wood should never be used for framing. When it is handsome enough, it should invariably be cut into veneer, and used for panels only. All veneered panels, whether seen on both sides or not, should be veneered on both sides, or the veneer will pull the panels round on the face. The best wood for veneering on is mahogany. Honduras will do, but it must be straight-grained. Wavy wood will not stand if it is worked solid in door panels, and this holds good for piano cases, and other articles of furniture.

ASH: *Fraxinus Americana*, syn. *F. Alba*, *F. Canadensis*, *F. Acuminata*, *F. discolor*, *F. Eupatoria*, and *F. Lancea*. Popular names—White Ash, American Ash, and Cane Ash. Found from Nova Scotia and Newfoundland South to Florida, West to Ontario and Minnesota, Nebraska, Kansas, Indian Territory, and Texas. Grows there in swampy wet lands, but requires good soil, as it does in this country; all attempts to grow ash here in poor soil will result in failure. Land good enough for Ash is good enough for crops. There is another ash grown in America, *Fraxinus Nigra*, syn. *F. Sambucifolia*, it is popularly known as Swamp Ash, Water Ash, Brown Ash, and Basket Ash. The White Ash is a tree from 60ft. to 100ft. high, and from 3ft. to nearly 6ft. in diameter, the largest specimens being found in the Ohio River basin. The Brown Ash seldom attains a greater height than 80ft., with a diameter of about 2ft. There is no figure in Ash, and the annual rings are marked by large open ducts, which are prominent in any tangential section of the wood. Certain excrescences on the trunks of Ash-trees are called "burrs" or "knots." They show a highly ornamental figure when cut radially, tangentially, or transversely: hence they are in great demand for veneer. A burr cut tangentially gives a grain something like bird's-eye maple, the eyes being much smaller in the Ash. Ordinary Ash is light brown, coarse-grained, hard, and strong. A cubic foot weighs about 40lb. Quebec Ash is sold in London at about 60s. per load when squared, but the price for first-class stuff may rise to as much as 80s., the logs being from 13in. to 20in. square, and from 14ft. to 21ft. long. Galveston round logs are worth from 1s. 1d. to 1s. 4d. per cubic foot. What is known in the trade as "American Ash" is sold by the superficial foot when cut into boards 1in. thick and under, and by the cubic foot when cut into boards thicker than 1in.; 3in. and 1in. boards are worth 13d., and boards from 1½in. to 1½in. vary in price from 1s. 6d. to 2s. 3d. per cubic foot. Hungarian Ash sells for about 1s. 4d. per cubic foot. **BASSWOOD:** *Tilia Americana*, syn. *T. Nigra*, *T. Glabra*, *T. Latifolia*, *T. Canadensis*, *T. Neglecta*. Popular names, Lime tree, Linden or Lin and Bee tree. Found in the North-East United States, less abundantly in Canada, westward to Nebraska and Kansas, and southward along the Alleghenies to the Gulf States. Basswood is light brown, with sapwood of the same colour, so that one is not easily distinguished from the other; it is soft, close-grained, and easily worked. It is very light, weighing not more than 28lb. to the cubic foot. The tree is usually about 80ft. high and 4ft. in diameter when fully grown (the inner bark is known as bast), and when in flower it yields honey in abundance. Hence its name, "Bee tree." Boards can be obtained from basswood up to 100ft. wide! This is done by cutting it continuously all round the log in a lathe specially made for this work. The builder should note that, unlike whitewood, basswood is liable to crack in seasoning. A tangential section of basswood gives a grain—something like maple, without the "bird's-eye"; radially the straight grain of the annual rings is faintly marked by horizontal bands of medullary rays. Basswood is worth here about 1½d. per foot super. 1in. thick. **BEECH:** *Fagus Ferruginea*, syn. *F. Americana*, *F. Sylvestris*, *F. Alba*, *F. Sylatica*. Grows in Canada and the north-east United States, west as far as Wisconsin, and south among the Alleghenies to Georgia, and attains its greatest dimensions in Wisconsin, Michigan, and the forests round the Great Lakes,

where trees 100ft. and over, with a diameter of 4ft. may be found. Beech is a hard, tough, close-grained wood, of a reddish-brown colour, the sapwood being white. The medullary rays are more marked on a cross-section of this wood than on any other section, though they show well as a "silver grain" on a radial section. The wood is heavy, weighing 43lb. to the cubic foot. Carpenters and joiners are familiar with it in their plane stocks; it is also much used for chair-making. It is a wood much subject to the attacks of worms. **BIRCH:** *Betula Alba*, syn. *B. Papyrifera*, and *B. Nigra*. There are several species, all without figure or ornamental grain of any kind, whether cut radially or tangentially. First-class birch planks are imported from Quebec, Halifax, and St. John; logs also come from the same districts. Pieces 2in. to 3in. thick, and from 7in. to 19in. wide, with lengths varying from 10ft. to 16ft., sell here for about 1s. 4d. per cubic foot; smaller sizes are worth about 1s. When the lengths are shorter—say, from 4ft. to 10ft.—the price would not be more than 9d. per foot, the value of the wood depending on the lengths and widths, the quality remaining the same. Logs squaring from 18in. to 20in. are usually sold by the load; they are worth about 35s. Nearly all the put-logs now used in scaffolding are birch. They are imported ready-made from Sweden, and are sold at from 4s. 9d. to 5s. 9d. per dozen in lots of 50 and 100 dozens. **BLACKWOOD:** *Acacia Melanoxylon*, is a large tree found growing in Victoria, New South Wales, South Australia, and Tasmania. The colour of the wood is usually a dark brown, and the grain either straight or wavy. This acacia is said to be one of the most valuable timber trees found in the whole of Australia, as the wood is durable, easily worked, and a good substitute for American walnut. Tasmanian Blackwood is imported in logs. When about 26ft. long and from 22in. to 26in. square, they sell here for about 3s. 3d. per cubic foot. A fair-sized log would contain about 106c.ft., the smaller sizes not quite half so much, or about 45ft.; a ton weight would be about 34c.ft., and a log of usual size, up to say 27in. or 29in. square, would probably be worth up to 4s. 6d. per foot for furniture. Blackwood from the Cape of Good Hope is a yellowish wood striped brown. It takes a good polish, and is a good furniture wood. It is cut from a tree known to botanists as *Royena Lucida*. Indian Blackwood is known here as "rosewood." CEDAR is a popular name applied to the names of very different trees; it is apparently given to all timber which yields that peculiar odour, so well known to those who use cedar pencils when the latter are cut, or the wood is anyway bruised or broken. Pencil Cedar is the wood known to botanists as *Juniperus Virginiana*; it is therefore not cedar but juniper. It has several other names, based chiefly on the localities from which it is derived, as, for instance, *J. Bermudiana*, *J. Caroliniana*, *J. Barbadiensis*. It is also known as *J. Feticida*, and *J. Sabina*, a Rocky Mountain variety, is probably *J. Scopularium*—the popular names are Red Juniper, Red Cedar, and Savin. This juniper is the most widely distributed of all the American Conifers; it is found from Canada to Florida, and westward to the Rocky Mountains, though it is not known in some localities within these limits. When well grown the tree is usually from 80 to 90ft. high, with a diameter breast-high of 3ft. or a little over. The wood is soft and easily worked; it has absolutely no figure when cut, either radially or tangentially, and is valuable only for its colour, which is a dull red, fading to purple on exposure to light, and for its smell, which is considered so pleasant by some people that they panel rooms with it. In former times it was commonly used to make the sides and bottoms of drawers, for the smell kept moths away, and in old furniture it is frequently found making up the whole article except the front, which is probably a very dark "Spanish" mahogany. This "Cedar" is, of course, easily recognised by its colour, even grain, and smell; the sapwood is always nearly white. There is a room at Kelham Hall (built by Scott) lined with "pencil cedar." The wood is now seldom used in building here, but in America it is worked up for internal joiner's work, and on the railways it is used for sleepers. A cubic foot of pencil-cedar weighs 30lb.

The United States Cedars are generally classed as "white" or "red," according to the colour of the heartwood of the trees, white Cedars having a heartwood light greyish brown, and red Cedars heartwood of a deeper red colour, the sapwood in

both being nearly white. The white Cedars are *Libocedrus Decurrens*, *Thuja Occidentalis*, *Chamaecyparis Thyoides*, and *Chamaecyparis Lawsoniana*, and the red Cedars *Thuja Gigantea*, the Juniper already described, and *Sequoia Sempervirens*. *Libocedrus Decurrens* is a large tree found growing among pines and firs in Oregon and California; it is about from 100ft. to 150ft. high, with a diameter of from 4ft. to 8ft.; the wood is fine-grained, weighing about 28lb. to the cube foot, though it is liable to rot; roof shingles and furniture are made with it. Another name for this wood is Incense Cedar. *Thuja Occidentalis*, or Arbor Vitæ, of which 48 varieties are recognised in cultivation, is found from Maine to Minnesota and northward to Canada, growing along streams and lake shores. In some districts the tree covers extensive swamps. Where well grown a few trees may reach a height of 60ft. with a diameter of 4ft., but generally speaking they are seldom found large enough to cut into deals or other "timber"; hence the wood roughly dressed is used for posts, rails, and sleepers. A cubic foot of this Cedar scarcely turns the scale at 20lb. *Chamaecyparis Thyoides* is a medium-sized tree found along the coast from Maine to Mississippi. Good specimens are from 80ft. to 90ft. high, with a diameter of from 2ft. 10in. to 3ft. 10in. The wood is soft and easily worked. It is also light, weighing not more than 21lb. to the foot; furniture, interior joinery, and shingles are made with this timber in the States. *Chamaecyparis Lawsoniana*, popularly known as Port Oxford Cedar, Oregon Cedar, Lawson's Cypress, and Ginger Pine, is a very large tree found growing in the coast region from California to south-west Oregon, seldom extending more than 40 miles inland; no less than 70 varieties are at present in cultivation. Lawson's Cypress grows from 150ft. to 200ft. high, with a diameter of 6ft. breast high, and some trees have been found with a diameter of no less than 13ft.; the wood is extensively used for all kinds of building work, being heavier and stronger than any of the other American cedars; a cube foot weighs close on 30lb. *Thuja Gigantea* or *Plicata*, the red Cedar of the West, is a very large tree which attains its greatest dimensions in low grounds skirting watercourses, and in swamps. It is found in Southern Alaska, Washington, Oregon, North California, and East Montana, growing to a height of from 100ft. to 150ft., with a diameter of from 3ft. to 10ft. The wood is everywhere used for cabinet-making, joinery, and roof shingles. Other Cedars are West Indian, *Cedrela Odorata*; East Indian, *Cedrela Toona*; North African (Algeria), Atlas Cedar, *Cedrus Atlantica*; Palestine Cedar, *Cedrus Libani*; the Deodar of the Himalayas is *Cedrus Libani*, var. *Deodara*; Moulmein Cedar, *Cedrela Toona*, found in Bengal, Assam, and Burma; Cape Cedar, *Callitris Arborea*; and Tasmanian Cedar, *Athrotaxis Selaginoides*. From the foregoing description of the various woods popularly known as Cedar, it is obvious that the architect must not rest content with using that name only in his specifications, for it will define very little; he must make himself acquainted with the chief characteristic properties of the particular Cedar he wishes to employ, find out where it is grown, and if it is imported here, specify accordingly. West Indian Cedar, Tabasco, Honduras, and Cuba is worth from 4d. to 6d. per superficial feet lin. thick. Log ends are usually sold for about £8 per ton. This cedar is common in the London market. African cedar is worth about 3½d. per super. foot lin. thick. Coccoloba wood, *Brya Ebenus*, or green ebony is grown in Jamaica. It is used for inlaying, electric bells, pushes, small door-handles, &c., the tree not growing large enough to furnish wood for larger work. Cottonwood is a poplar. There are twelve species of this tree; but that known as *Populus Deltoidea* furnishes most of the cottonwood coming into the English market. The wood is whitish grey or pale yellow, with white sapwood. It is soft, easily worked, not durable, and when the grain is not straight it twists a good deal in seasoning. When cut radially the surface shows a straight figureless grain. Tangential sections show markings of the medullary rays; but it is not a handsome wood under any circumstances, though any face shows a satiny lustre after a sharp plane. This poplar is a large-sized tree (90ft. to 150ft. high, with a diameter of from 6ft. to 12ft.); it forms extensive forests in the Mississippi Valley, and in New England to the Rocky Mountains. In the States it is known as Necklace Poplar, Carolina

Poplar, and Big Cottonwood; botanically it is also known as *P. Angulata*, *P. Lævigata*, *P. Angulosa*, *P. Canadensis*, *P. Virginiana*, *P. Marylandica*, and *P. Lindleyana*. The tree is called "cottonwood" from the seeds, which are furnished with long "cotton" filaments, these being blown away in clouds by the wind. Cottonwood is usually put on the market here cut into boards 1½in. thick, and from 6in. to 24in. wide. These are sold by the cube foot, which is worth about 1s. 8d. Ebony: *Diospyros*, the order *Ebenaceæ*, contains two genera: *Maba* and *Diospyros*. The latter is a large one, and it includes all the different species of ebony; but that known as *Diospyros Ebenum* is the chief ebony-yielding tree. Ebony is the well-known jet-black, close-grained hard wood, of which the sapwood is grey striped with black. It is a very heavy wood, the heart weighing 74lb. to the square foot. Ebony grows in the forests of the Deccan and Carnatic, and also in Ceylon, where it is an important wood. Formerly the forests in the latter country were cut at the rate of 2,600 tons yearly—a consumption which threatened the total exhaustion of the ebony there; but the cut is now reduced to about 300 tons. Ebony is a slow-growing tree: it is not quite 6in. diameter at 25 years, 12in. at 75 years, 18in. at 135 years, and 2ft. at 300 years; the largest tree ever seen measured only about 27in. in diameter. It has been ascertained that the darker the colour of ebony, the more durable it is, and that the colouring matter is not in the cell walls, but in the cells themselves. Ebony is sold by weight here. Ceylon logs, average of 68, weigh about 4½cwt. Much smaller pieces come into the market from Madagascar; the wood is usually sold at £15 per ton. Ebony is used for inlaying, and balusters in staircase or other ornamental work. Elm: *Ulmus Americana* is a hard, strong, tough wood, cross-grained, not easily cleft or worked; it warps and splits in drying, so that it must be carefully handled. English elm was formerly much used in the outer sheathing of barns, where the board surfaces became almost as hard as iron under exposure. In the States and Canada elm is used for agricultural instruments, and latterly it is becoming fashionable in furniture; bastard cut, or tangential stuff, sometimes showing beautiful figure, is sometimes selected for this purpose; it takes a high polish. Elm is a heavy wood, it weighs over 40lb. to the cube foot. The heartwood is light brown, and the sapwood yellowish white. From Southern Newfoundland to Lake Superior, and the eastern base of the Rocky Mountains, and southward to Florida and Texas the Elm is found growing, the finest trees being those of the Temperate Zone, many of which are 100ft. high, and from 6ft. to 7ft. in diameter. The American Elm is known in the States as the "White Elm" and the "Water Elm." Botanists know it too as *Ulmus Alba*, *U. Mollifolia*, *U. Pendula*, and *U. Floridana*, all of which are synonyms for *U. Americana*. Another Elm is the Rock Elm, *Ulmus Rupestris*; it is also known as Cork Elm, Hickory Elm, Cliff Elm, Thomas Elm, and Wahoo. It is called Rock Elm from the curious projections found along its branches after they are three or four years old. The wood is hard, compact, tough, and very strong; the fibres are laced or contorted, so that it is not easily cleft; the heart is light brown, and the sapwood a dirty white. The width of the annual rings in the Rock Elm vary very considerably; the medullary rays are not distinct, and any figure in the wood is seen only on tangential sections; it weighs over 45lb. to the cube foot. Rock Elm may be distinguished from White Elm by the size of the open ducts, which are well marked in the boundaries of the annual rings in the latter; these are not nearly so distinct in the Rock Elm. First-class waney Elm logs sell here from 57s. 6d. to 65s. per load, the logs being from 12ft. to 26ft. long, and from 13in. to 26in. square. Quebec Elm, 50ft. long and 12in. square is worth more; it brings sometimes as much as £5 12s. per load, the great length increasing its value. Fir is a name very frequently applied to wood which is not fir. In England architects write of Memel "fir," Baltic "fir," "Scots "fir," and other "firs" which are not fir—they are pines. Spruce is sometimes called "fir," and so is larch. The wood is something like spruce, but fir may be distinguished from pine, larch, and spruce by the absence of resin-ducts.

The Firs are all known to botanists as *Abies*, the largest being *Abies Grandis*, which is found from Vancouver to Central California, and eastward to Montana; it attains its greatest develop-

ment in Western Washington and Oregon. Some of the trees are 300ft. high with a diameter 5ft. breast high. This is a white fir, and it furnishes much of the building timber where it is found; a cube foot weighs 22lb. *Abies Amabilis* is another white fir; it forms extensive forests in the mountains of Washington and Oregon, and attains its best development in British Columbia, where it grows to 150ft. with a diameter of over 4ft. *Abies Nobilis* is a red fir very often confounded with Douglas fir; with *Amabilis*, *Nobilis* forms extensive forests on the Cascade Mountain slopes, between 3,000ft. and 4,000ft. in Oregon. This tree is also common in Washington; a cube foot weighs about 28½lb. *Abies Magnifica* is another red Fir. It attains a height of over 250ft., with a diameter of 10ft. or more. This tree forms forests about the base of Mount Shasta, in California; it is also found along the Sierra Nevada Mountains, to the south of Shasta. The wood twists and warps in drying, which render it unfit for building, so that its chief use is for fuel. Another fir, *Abies balsamea*, which is found growing from Minnesota to Maine and northwards, is often cut with pine and spruce, and sold with them on being cut into deals and other scantlings. None of these firs come into the London market; they are not used for building in this country. Architects and surveyors should therefore cease to specify "fir" of any kind for their buildings, as there is no such timber in the trade at present. Timber merchants, shippers, brokers, and others talk of Dantzic "fir," Libau "fir," and Riga "fir," but there are no such timbers;—they mean pine in each case. Hickory (*Hicoria ovata*) is a tall, slender tree found in scattered clumps or small groves among other broad-leaved trees from Lake Ontario to Texas, and from Minnesota to Florida, but always best developed in the Ohio and Mississippi River basins. It has a variety of popular names, such as shell bark, shag bark, scaly bark, upland hickory, white walnut, and sweet walnut; the botanical names are quite as numerous. The wood is hard, strong, tough, coarse-grained, smooth, and usually straight grown, a cube foot weighing over 52lb. It is used for carriages and waggons, as well as for implements and machinery; it makes good tool-handles. A radial section of this wood, which is light brown with creamy-white sapwood, shows little figure; but a bastard cut, or triangular section, shows figure, with open ducts distinctly marked on each ring boundary. When this tree is sufficiently old, long plates of the outer bark hang loosely from the trunk and branches, and this peculiarity gives the tree its name. Hickory is also obtained from *Hicoria Alba*, *H. Glabra*, *H. Minima*, and *H. Pecan*, known popularly as Mockernut Hickory, Pignut Hickory, Bitternut Hickory, and Pecan; the latter being a common tree in Indiana and Nebraska, and southwards to Louisiana and Texas. Hickory is brought into the market here in round logs, and sold by the cube foot, Customs string measure; poles are also sold at so much each, 12ft. long by 4½in., tapering 3½in., 4in. tapering to 3in., and 3in. tapering to 2½in. HORNBEAM (*Carpinus Betulus*) is found all over Europe; it is indigenous in the south of England, but it is planted in the North and in Ireland. Nearly all the hornbeam used here comes from France. It is a tough, close-grained, durable wood, with no heart, the wood always remaining in the condition of sapwood, a peculiarity which makes some people think it is all heartwood, as no change can be distinguished in the trunk. It is worth, in the round log, 10½d. to 11d. per foot cube.

PRACTICAL BUILDING CONSTRUCTION.*

A REVISED and enlarged edition of the above treatise on building construction, by John Parnell Allen, Lecturer on Building Construction at the Durham College of Science, Newcastle-on-Tyne, &c., has been published in which the author has brought this useful handbook up to date, and has extended its pages to meet the requirements of education authorities. Practical matters of everyday occurrence have been dealt with, including those branches of work allied to building, such as electric lighting, and other branches of engineering, &c. The author acknowledges his indebtedness to Mr. Thomas Hanning, A.M.I.C.E., for valuable advice and

* Practical Building Construction: A Handbook for Students. By JOHN PARNELL ALLEN. Fourth edition, revised. With over one thousand illustrations. London: Crosby Lockwood and Son.

The general works committee of the Coventry city council have passed plans for a new street from Gosford-street to Whitefriars-street, and recommend that the work be carried out by the direct employment of labour at an estimated cost of £1,660, whilst it is recommended that the sanction of the Local Government Board be sought to a loan of £2,137 for the making-up of Bricksell-lane.

KING'S COLLEGE AND CARPENTERS' COMPANY'S CLASSES.

THE following is the list of prize-winners and certificates awarded in the examinations at the conclusion of the classes held at King's College in Building Construction, the Studio, Constructional Drawings and Quantities, and Architectural History, under the joint control of King's College and the Worshipful Company of Carpenters.

LIST OF PRIZE WINNERS.

FACULTY OF SCIENCE. DIVISION OF ARCHITECTURE. EXAMINATION IN BUILDING CONSTRUCTION.

Perkins, J.	£2 in books and 1st class certificate.
Hampshire, E. L.	£1 10s. " and 1st " "
Hopkins, W. I.	£1 " and 1st " "
Norton, A.	1st class certificate.
Winteringham, C.	1st " "
Payne, A. C. H.	1st " "
McLachlan, I.	1st " "
Nichols, W.	1st " "
Blomfield, C. G.	2nd " "
Bentley, O.	2nd " "

SANITARY BUILDING CONSTRUCTION.

SIR GEORGE FAUPEL PHILLIPS' MEDAL.

Norton, A. Bronze Medal.

EXAMINATION IN QUANTITIES.

Lodge, A. R. A.	£2 in books and 1st class certificate.
Norton, A.	£1 10s. " and 1st " "
Fairhead, H. A.	£1 " and 1st " "
Blomfield, C. G.	1st class certificate.
Peacock, W. H.	1st " "
Fairhead, H. G.	1st " "
Perkins, J.	2nd " "
Allright, F.	2nd " "
Brice, C. H.	2nd " "

EXAMINATION IN CONSTRUCTIONAL DRAWING.

Judges, W. H.	£2 and 1st class certificate.
Martin, C.	£1 10s. and 1st class certificate.
Ixer, S.	£1 and 1st " "
Perkins, J.	1st class certificate.
Winteringham, C.	1st " "
Blomfield, C. G.	2nd " "
Guimaraes, R. A. F.	2nd " "
Cooper, A.	2nd " "

FACULTY OF ENGINEERING.

EXAMINATION IN ARCHITECTURAL HISTORY.

Ixer, S.	1st Class.
	£2 in books.
	2nd Class.
Sefton, H. W.	£1 in books.
Dunn, G. M.	Certificate of Merit.
Ling, R. B.	" " "
Hunt, H. C.	" " "
Covernton, C. H.	" " "

3RD CLASS.

Strudwick, F. J.	Keed, E. G.
Jorgenson, J.	King, H. W.

ARCHITECTURAL SKETCHING CLASS.

Ixer, S. £1 in books.

STUDIO, EVENING.

Nicholls, J.	£2 in books and certificates of distinction.
Gomme, S. A.	Certificate of distinction.
Smith, E. T. L.	" " "
Smith, J. B.	" " merit

The library and museum in connection with these classes is being revised and added to during the recess, as also the fees and prizes, and a new catalogue of the numerous exhibits and reference drawings will be ready before the opening of the Session 1903-4. The opening of the 14th Session will take place on September 28 at 7 p.m., and the examination for the two free scholarships will be held on September 21, 7 to 9 p.m. Further particulars will be duly advertised.

THE TESTING OF BITUMENS FOR PAVING PURPOSES.*

IT is very evident, from the literature on the subject, that the theory of asphalt construction is but little understood. This is because the proper physical laws are not applied in reasoning on this subject, which is not surprising when we consider that the other cementing materials in general use in engineering work are solids, and involve the laws governing the cohesion and adhesion of solids to each other; while in the case of asphalt construction we have entirely different principles involved—those governing the cohesion of liquids and adhesion of liquids to solids, for asphalt paving cements are fluids in every sense of the word. It is either because this fact is unknown, or because it is not taken into account by analysts and engineers, that the majority of literature on the technical examination of asphalts is so lacking in value.

To illustrate this better, a description of how one class of asphalt pavement is constructed and

a discussion of its properties will not be amiss. What is known as a sheet asphalt pavement is made by coating sand with an asphaltic cement. As the asphaltic cement used is excessively viscous at ordinary temperature, this mixing is of necessity done while the materials are heated to a degree sufficiently high to render the cement so liquid as to coat the sand readily. This mixture of sand and asphaltic cement is spread on the street and compressed into a continuous sheet by means of rolling. These operations are performed while the mixture is heated, as it is more easily handled and compressed while in this state. This pavement must have the following properties:

(1) It must be composed of such a material that it will not crush or be ground away by traffic at any climatic temperature. To accomplish this it is evident that the asphaltic cement which surrounds the sand grains must be pliable and elastic at all temperatures, for if it were solid and rigid the mixture would soon grind away.

(2) As an asphaltic pavement is laid in one continuous sheet, it is necessary that the cement used be so ductile, even at the lowest temperature obtained, that the pavement may contract without cracking.

(3) It is also necessary that the pavement be so firm at the maximum climatic temperature obtained as to withstand the passage of traffic without either being cut into so badly as to be objectionable, or shored to the side of the street.

(4) The paving mixture must be so dense as to preclude the entrance of water into its voids, for if water enters and freezes, the mixture is expanded and becomes spongy, and if the asphaltic cement is not sufficiently pliable, it will wear away by abrasion.

(5) The pavement must not contain any material that is acted on by water, for even though a paving mixture be used that is so dense as to preclude the entrance of water into it, yet the mixture being pliable under the passage of traffic, water will work up into it.

(6) The pavement must not contain an asphaltic cement that will age so rapidly as to cause the pavement to lose its pliability within a reasonable period of time.

It is evident if a pavement possesses all these qualities, that it will be durable under all normal conditions.

Although the use of different sands in a pavement will change its physical properties somewhat, yet they are principally dependent on the physical properties of the asphaltic cement with which it is constructed. A pavement, to possess the properties above enumerated, must contain an asphaltic cement which will be so ductile at the minimum temperature obtained in the climate in which it is laid as to permit a contraction of the pavement without cracking. At the same time, the asphaltic cement must not be rendered so fluid by the maximum climatic temperature that it will produce a pavement objectionably soft.

The asphaltic cement must have the properties of a liquid at all temperatures to which it will be subjected. It is upon this property that the adhesiveness of an asphaltic cement depends—that is, comparing two asphaltic cements of the same degree of consistency, the one that approaches more closely to being a true liquid possesses the greater adhesiveness. This is true not alone from observation, but is self-evident when we examine into the reason that a bituminous cement is adhesive. The property of adhering is not chemical, but purely mechanical, and the more fluid the cement is, the more completely and perfectly will it flow into every cavity of the surface with which it is in contact, thus producing a more perfect bond of adhesion. The less fluid an asphaltic cement is, the more imperfect is the solution of two or more of its constituents in each other.

Besides these physical properties, the asphaltic cement must be able to withstand the heating to which it will be subjected in the process of manufacture into pavement, without having its physical properties materially changed, and the asphaltic cement must not be rapidly hardened or so changed by age as to lose desirable physical properties, such as ductility and pliability, in an unreasonably short period of time.

For the determination of the above properties Mr. Dow has devised the following tests:

Ductility.—The ductility of an asphaltic cement is determined by ascertaining the distance that a prism of this cement can be drawn out before breaking. This test he makes at 20 and 77° Fahr.

The one that is the more ductile is the more perfect fluid, and hence the most cementitious.

Softness at High Temperatures.—The softness of an asphaltic cement at high temperature he determines by ascertaining its consistency at 32, 77, 100, and 115° Fahr. The rate of softening of an asphaltic cement is thus determined, and an idea can be formed as to whether it will be too soft for use at the maximum climatic temperatures.

Fluidity.—As to how true a fluid an asphaltic cement is, the determination is made as given above, by ascertaining its ductility.

Heat Test.—To ascertain whether the asphaltic cement will be injured by the heating which it must undergo during the process of manufacture into the pavement, is determined by submitting a quantity of asphaltic cement of known consistency by penetration at 77°, to a temperature of 300° for eight hours. During this heating the asphaltic cement is stirred from time to time to break up any skin which may form on its surface, thus protecting it from evaporation and oxidation. After this heating the cement is allowed to cool, and its consistency by penetration is again taken at 77°, the difference in penetration being the amount of hardening resulting from the prolonged heating.

Change due to Ageing.—All bitumens undergo a more or less rapid change with ageing, that appears to be due to two, or possibly more, causes. Two distinct changes manifest themselves. One is the surface-hardening, which is probably due to oxidation, and possibly due to the volatilisation of light oils. It begins at the surface, and gradually extends into the bitumen. The other is a hardening of the entire mass, evidently due to condensation of molecules. Both these changes take place in all bitumens, but one or the other may predominate. The former is much the less objectionable, as it makes but slow progress into the mass.

The best method for determining the ageing of the asphaltic cement, although it is somewhat slow, is as follows:—The asphaltic cement is placed in a sample tin, and its consistency by penetration determined at 77°. This sample is then put away in some place protected from the dust, but without a cover, so as to have free access to the air. At the end of two weeks or a month the consistency of the sample is again tested at the same temperature, when it is again put away. This testing every few weeks is kept up until the sample is appreciably hardened. A slanting cut is then made into it with a sharp thin knife, laying over the upper piece, this exposing a gradual descent from the surface into the interior of the cement. Penetrations are now taken down the side of this cut, beginning at the surface. In this way the increase in hardness of the surface and the interior over its original consistency is determined; also, the hardening of the surface over the interior, and the depth that the surface-hardening has entered the sample.

Another method which Mr. Dow has lately employed, and which is somewhat more rapid, is by taking an asphaltic cement of known consistency by penetration at 77°, and spreading 50 grams of it on a piece of plate-glass 9 in. square. The plate thus coated is placed in a dustproof drawer. At the end of two weeks or a month the coating of cement is scraped from the plate by a steel straightedge, and moulded into a suitable receptacle at the lowest temperature possible. The consistency by penetration is again taken, and the increase in hardness of the asphaltic cement indicates its rapidity of ageing. This method, of course, does not differentiate between the two hardenings.

As all asphaltic cements are not of the same degree of purity, it is necessary for comparison that the tests for their physical properties be made on a basis of the pure bitumen. For this reason it is necessary to ascertain the relation existing in the various tests made on the asphaltic cement, and the pure bitumen it contains. After such a ratio has once been established, test can be made on the asphaltic cement, and allowance made for the impurities other than bitumen. Due allowance can then be made in comparing the results of physical determinations on cements of different purities.

Carbon Disulphide Soluble.—As the cementing material in a paving mixture or asphaltic cement is the pure bitumen it contains, an extraction with carbon disulphide is made to ascertain the amount of this cementing material. It is also of use to determine the purity of an asphaltic

* Abstract of a paper read by Mr. A. W. Dow before the American Society for Testing Materials.

cement to aid in drawing conclusions from the physical tests.

For the extraction of bitumen some experimenters advise the use of other solvents, such as chloroform and turpentine, because they extract more from bituminous materials than does carbon disulphide. The use of these more powerful solvents is unnecessary and confusing, as, at its best, this test is only comparative, for there is strong evidence to show that even carbon disulphide, in the case of some asphaltic cements, dissolves more bitumen than really acts as a cementing material, and in the cases where all the bitumen appears to be cementitious, the chloroform and turpentine dissolve little if any more than does the carbon disulphide. This being true, Mr. Dow sees no reason for adopting a still more powerful solvent. Carbon disulphide also has the advantage that it is more readily obtained pure, is less hygroscopic and cheaper than chloroform and turpentine.

Naphtha Soluble.—The test for the amount of bitumen soluble and insoluble in naphtha, or as it is better known, the test for the petroleum and asphaltine, is usually made by extracting the asphaltic material with petroleic ether. The bitumen that dissolves in the solvent is called petroleum, and that portion which is insoluble but which dissolves in carbon disulphide is spoken of as asphaltine.

Mr. Dow believes there has never been a test that has caused more confusion than this, by its being misinterpreted and its value over-estimated. It is of no value at all, as is sometimes claimed, in determining whether or not an asphalt will make a good pavement. The amount of bitumen soluble in naphtha is of no value excepting as indicating, within broad limits, the degree of hardness of an asphalt. The test is of advantage because it requires no apparatus other than is found in every chemical laboratory, and if standard methods could be adopted, it would be of value as indicating in a limited degree the consistency of the asphalt.

Action of Water on Pavements.—The action of water on asphalt pavements has, in the past, received little or no consideration from engineers. This question is a very important one, and the asphalt should be examined to determine whether or not it is attacked by water or moist air. There are many failures resulting from this action that have been blamed to other causes in the past, and a more thorough study of this subject is much to be desired. A simple method to ascertain the rapidity of the action of water is to coat a piece of glass with the asphalt paving cement, and partly submerge this coated glass in water. The coating is examined at intervals, and the time noted when the first discoloration or action is noticed on the surface of the sample.

Another method sometimes used is to mould two lin. cubes of the paving mixture under a fixed pressure. This mixture is made with a standard sand, and the same amount of bitumen used each time. One cube is immersed in water while the other is kept in air. These cubes are examined at the end of a month or two, and any increase in the volume or softening of the one in water over the one kept in air is noted.

Among the alterations now in progress at the City Temple, London, is the removal of the large platform which was built round the pulpit. Although this rostrum was convenient for public meetings, it detracted very much from the appearance of the pulpit, and hid the pillars and arches beneath it. When the building is reopened, the gift of the City Corporation to Dr. Parker will again be visible in its original form.

The extensive business premises of Messrs. Jarrolds, publishers, at the junction of London-street and Exchange-street, Norwich, and facing the great Market Place, are being rebuilt from plans by Mr. G. J. Skipper, F.R.I.B.A., of Norwich, and at the same time the ground floor of the frontage to Exchange-street will be set back 5ft., the upper stories being carried on a colonnade.

The Countess of Leicester opened, last week, a new nurses' home in connection with the Norfolk and Norwich Hospital at Norwich. The Earl of Leicester had already contributed £15,000 to found the home, and Lady Leicester announced that he had given another £5,000, the income of which is to be permanently devoted to the maintenance of the home.

A memorial to the members of the King's Liverpool Regiment, who fell in the South African War, is about to be erected in St. John's Gardens, Liverpool. The commission has been intrusted to Mr. Goscombe John, A.R.A.

COMPETITIONS.

MANCHESTER ROYAL INFIRMARY.—The Board of Management of the Manchester Royal Infirmary held a special meeting on Wednesday to consider the selection of architects to prepare competitive plans for the new infirmary, which will be built on the Stanley-grove site. Out of 56 names submitted, the building committee, on the recommendation of the architect assessor, had selected twelve to prepare plans. The board approved the twelve, as follows:—Mr. H. Percy Adams, London; Messrs. Campbell, Douglas, and Paterson, Glasgow; Messrs. Edwin T. Hall and John Brooke, London; Mr. W. Cecil Hardisty, Manchester; Messrs. Heathcote and Sons, Manchester; Messrs. Henman and Cooper, Birmingham; Mr. John W. Simpson, London; Messrs. Thomson and Sandilands, Glasgow; Mr. A. Hessel Tiltman, London; Messrs. Waddington, Son, and Dunkerley, Manchester; Messrs. Thomas Worthington and Son, Manchester; and Messrs. Young and Hall, London.

NEWCASTLE (STAFFS).—For the erection of new Wesleyan Sunday-schools and caretaker's house the designs sent in by Messrs. Garside and Pennington, architects, Pontefract and Castleford, have been accepted, and they have been appointed architects for the work. The estimated cost is about £2,000. The designs were submitted under a *nom-de-plume*, and the trustees engaged professional advice and adopted the report of the assessor.

TAUNTON.—There were 81 designs submitted in the competition for the Carnegie Free Library, Taunton, and these will be on view on Saturday and during next week from 12 till 7 at the Municipal Hall. The assessor, Mr. J. Gibson, London, has awarded the premiums as follows: No. 51, Mr. A. Colbourne Little, 9, Gray's Inn-square, London; No. 29, Mr. J. Lindsay Grant, 2, St. Peter's-square, Manchester; No. 42, Mr. Henry A. Crouch, 12, Gray's Inn-square, London.

CHIPS.

The urban district council of Featherstone have adopted plans by Mr. George Hodson, C.E., of Loughborough, for sewerage the district at an estimated cost of £12,625.

The corporation of Bristol is building, on the recommendation of the health committee, a lodging-house for casuals in Wade-street, to provide 120 beds, at a cost of over £7,000.

For some time past complaint has been made of the difficulty of hearing preachers in the nave of Ripon Cathedral, and to overcome this objection a sounding-board for the pulpit in the nave has just been constructed. The board has been supplied by a New York firm.

Princess Henry of Battenberg has consented to unveil the memorial to Queen Victoria at Newport, Isle of Wight. It consists of a column of Illopton Wood stone, rising to a canopied head, and finished with a spirelet and cross. Around the base are four erect female figures, emblematic of the Virtues, and over the die and steps of Portland stone are grouped couchant lions. The architect is Mr. Percy G. Stone, F.S.A., whose design, selected in open competition in which fifty schemes were received, was illustrated in the BUILDING NEWS for July 11, 1902.

Lord Monkswell, chairman of the London County Council, last week opened the Fulham Park extension for the public use. The land is the remaining portion of west meadow (known as Fielder's Meadow), and contains nearly nine acres. It lies to the north of Fulham Park. A contribution of £12,000 was made by the County Council towards laying out the added area, which was the gift of the Ecclesiastical Commissioners.

A stained-glass window has been given to Egg Buckland church in memory of the late Mr. Richard Risdon, a former mayor of Plymouth. It represents the parable of the Good Samaritan. In one light the Good Samaritan is ministering to the wounded man sitting by the roadside, while in the distance the priest passes by. In the other light he is supporting the wounded man as he takes him to a place of safety. The work has been executed by Messrs. Fouracre and Son, of Stonehouse, Plymouth.

The Merchant Venturers' Technical College at Bristol is to be greatly enlarged by new workshops by and laboratories, increasing the present floor area 12,000ft. The space now available for the mechanical laboratory will thus be more than doubled, while the electrical engineering laboratory will be enlarged to a nearly equal degree. The hydraulic laboratory will be much increased in size, and an entirely new physical laboratory will be arranged for.

PROFESSIONAL AND TRADE SOCIETIES.

HAMPSHIRE ARCHAEOLOGICAL SOCIETY.—The members of the Hampshire Field Club and Archaeological Society spent a very interesting day in South-east Hants last week, and crossed the border into Sussex to visit Westbourne and Bosham Churches. The first halt was at Warblington, in Hampshire, which possesses an interesting church with Saxon remains, and had an equally interesting castle, of which but little is now above ground. The castle was the birth-place of Bishop Cotton, of Salisbury (temp. Elizabeth), and the temporary home of the Countess of Salisbury, the mother of Reginald Pole. Some interesting notes on the historical associations of the place were read by Mr. T. W. Shore. The church of St. Thomas à Becket is assigned by tradition to the generosity of two maiden ladies of the house of Warblington, and stone coffins with female effigies have been found in the aisles. The south side of the nave has some fine clustered columns, which are in striking contrast to the plainness of those on the north side.

ROYAL ARCHAEOLOGICAL INSTITUTE.—At the concluding business meeting, held on Monday night in York, Sir Henry Howorth (president) in the chair, the place of next meeting was discussed, and Bath and Bristol, Ireland and Normandy were mentioned, the president suggesting that a joint meeting with the French Institute might be arranged for Normandy. A discussion arose in reference to the best method of studying archaeology and history. Sir Henry Howorth, in proposing a vote of thanks to the French delegates, said the English archaeologist was gaining much from a comparison with the clear and logical expression of the French scientists. Mr. Micklethwaite, in seconding the motion, which was passed, recognised with satisfaction the growing interest which French and Italian archaeologists are displaying in English architecture and antiquities.

Mr. A. D. Price, M.I.O.S.E., an inspector of the Local Government Board for Ireland, has held an inquiry at Lisburn into the urban district council's application for a loan of £34,000 for sewerage purposes.

The rural district council of Chesterfield recently considered a scheme of water-supply for the southern districts, estimated to cost £18,000. The scheme, which has been prepared by Mr. Firth, the water engineer, and provides for two service reservoirs, was adopted.

A new theatre to accommodate 1,320 persons is to be built at the corner of High-street, Lewisham, and Hither Green-lane, from plans by Messrs. Briggs and Jeyes.

Public swimming baths are to be erected by a syndicate in Kirkcaldy, and plans are being prepared by Mr. Swanston, architect. The baths include Turkish, Russian, and plunge baths, also recreation rooms, consisting of billiard and reading rooms, and a gymnasium. The buildings are estimated to cost from £10,005 to £12,000, and they will be erected in Sands-road, at the foot of Tolbooth-street.

For the erection of a new lecture-hall at Bardney, in connection with the Wesleyan chapel, the tender of Mr. B. Fanthorpe, Lincoln, for £364 18s., has been accepted. The architects are Messrs. W. Mortimer and Son, Lincoln.

Last week in the belfry of St. Sidwell's tower, Exeter, the Rev. M. Kelly, of Kelly House, Lifton, and President of the Devon Guild of Ringers, unveiled an alabaster tablet presented by Messrs. Hems and Herbert (Vice-Presidents of St. Sidwell's Society of Ringers) to record the first peal of Grandirecaters ever rung by an Exeter band alone, and who were members of St. Sidwell's Society. Mr. Lucas (the junior Warden) thanked Messrs. Hems and Herbert, and spoke of the artistic way in which the work had been carried out by Mr. Hems.

A handsomely carved and embellished obelisk of Portland stone, designed by Mr. Reginald Blomfield, was unveiled at Haileybury College on Saturday afternoon, by Lieutenant-General Sir John French to the memory of thirty-five Old Haileyburians who fell in action or died of wounds or disease in the South African War.

The memorial which the Navy League have had placed in the south wall of St. John's Church, Ladywood, in honour of Walter Grounds, who was the champion shot in the British Navy, was unveiled last Sunday morning by Mr. Arnold White. The memorial is of beaten bronze, oval in form, and 3½ft. in height, bearing a representation of the *Terrible* over an inscription testifying to the qualities of the deceased.

Building Intelligence.

BELFAST.—The Royal Victoria Hospital, Belfast, was opened by their Majesties the King and Queen on Monday. The building occupies an excellent site of six acres at the junction of Grosvenor-street and Falls-road. The architect is Mr. William Henman, F.R.I.B.A. Working drawings were prepared in conjunction with his partner, Mr. Thomas Cooper, A.R.I.B.A., and in the autumn of 1900 a contract was entered into with Messrs. McLaughlin and Harvey, builders, of Belfast, who have carried out the work. Messrs. Henry Lea and Son were appointed consulting engineers, Mr. G. A. Flower acted as clerk of works, Messrs. W. H. Stephens and Son being the quantity surveyors. The accommodation provided is for 300 patients, eight resident medical and surgical officers, a superintendent, a matron, 78 nurses, and 32 male and female servants. The novelty in the design is that the whole of the accommodation for patients is on the ground-floor level; the wards (19 in number), with their accessory rooms, being placed side by side, lighted by large end windows, having a pleasant outlook to the south over park-like land, and by side clerestory windows. This is insured by the employment of economical means by which the whole atmosphere of the building is changed ten times per hour in summer and seven times in winter, without the necessity for opening any windows. The air is cleansed and tempered, so that both by night and day the whole hospital is maintained in a fresh and wholesome condition, without draughts or open fireplaces, and the noise, dirt, and attention they require. An important consideration in connection with this new principle of hospital construction is its economy, £300 per bed being the limit of outlay on the buildings and all engineering requirements. We fully illustrated and described the hospital in our issue of May 31, 1901, when a plan and two views of the building were given.

BRIDLINGTON QUAY.—An inquiry has been held at Bridlington Quay into the construction of the new parade extension scheme embracing sea defences, a new footpath, and pavilion, at a total cost of £32,800. Messrs. Mannall and Littlewood are the architects. Mr. W. H. Littlewood explained the designs for the new pavilion and shops. The building was to be octagon in shape, and shelter accommodation provided for 2,000 persons. On the western side would be a raised gallery. The building would be mainly of timber and iron, with plate glass in front, and large windows on three sides. There would be four entrance swing-doors, and in addition the whole of the glass front would be made to open in case of necessity. An octagon lantern light in the centre of the large hall would act as a ventilator, and windows around would open. The roof of the refreshment-rooms was to be of concrete, to be used for promenade or refreshment purposes, and a raised platform would be built in the hall to accommodate forty performers. Dressing-rooms and other necessary offices were specified.

BROADWATER DOWN.—The Church of St. Mark, Broadwater Down, has recently had an addition made to it in the shape of a large and handsome choir vestry, at a cost of £700. The material is sandstone, and the dressings, the traceried windows, string-courses, rear arches, lintels, &c., are in Box Ground Bath stone. The vestry has been built in keeping with the church, the architects being Messrs. Roumieu and Hitchison (the senior partner being son of the late architect of the church), and the builders Messrs. George Mansfield and Son, the same firm which thirty-eight years ago built the church itself. The reredos has been redecorated, the screen between the chancel and clergy vestry put back far enough to give another row of choir stalls, the door into the chancel has been widened and a wider passage made for the entry of the choir, the old reading-desk removed, and a carved chair and desk placed in the chancel.

CAMBERWELL.—The formal opening of a large block of buildings forming the extension of the Camberwell Infirmary and involving an outlay approaching £200,000 took place last Friday. The old infirmary in Havit-street has been altered and modernised to form part of the larger institution, which is now practically completed. It covers a site of several acres, and provides accommodation for 800 patients and a staff of about 200 persons. There is a fully-equipped operating

theatre, with recovery-room attached, and an electric treatment-room with all modern appliances. The building is electrically lighted; it has electric lifts of a special labour-saving type, electric ventilation, and is heated on a system existing only in one other institution in London. The site faces Brunswick-square (a well-wooded open space recently acquired for the public), and, although close to the main highway, is quite removed from the noise of the traffic. Special provision has been made for the application of the open-air treatment to consumptive patients.

CARLIS BAY.—A new chapel erected by the Wesleyans at Carlis Bay was opened for worship on Friday. The church is of Gothic design, the materials being granite dressings with grey elvan stone. A tower rises at the north-east angle to the height of 65ft. In the main front there are four windows of stained glass. The seating accommodation is for 250. Mr. Oliver Caldwell, Penzance, is the architect, and Mr. Glasson, Carlis Bay, the contractor, the plumbing being carried out by Mr. S. R. Taylor, Penzance. The contract price was £1,800.

LEEDS.—The old Police-station in Beeston-road, Leeds, has been discarded and a new one erected in its place. At the same time the corporation authorities have embraced the opportunity to provide a free library, which forms part of the structure. The new building, which occupies a site at the corner of Dewsbury-road and Hunslet Hall-road, was opened last Friday. In the police-station the architects, Messrs. F. W. Bedford and S. D. Kitson, have done everything possible to facilitate the work of the officers, whilst they have not overlooked other requirements. The five lock-up cells, lined and vaulted in glazed brick, are under the eye of the constable in charge, and on the ground floor there is also a large parade-room, with access to an open drill-yard. On the floor above, provision has been made for six constables to sleep, whilst adjoining the bedroom there is a kitchen and recreation-room. A reel-house has also been designed to accommodate two engines, with storage-room for hose-pipes and other fire appliances. The library is situated at the southern end of the site, and has three entrances, leading through a large hall into the library itself, the general reading-room, and the ladies' room. Provision has been made for over 20,000 volumes.

PORTSLADE-BY-SEA.—New schools in this growing suburb of Brighton were opened by the Lord Bishop of Chichester on the 22nd inst. The walls are of brick, plastered throughout, with painted cement dados. The roofs are covered with tiles, the floors of school and classrooms laid with wood blocks, and the corridors, caprooms, and lavatories with granolithic paving. The warming is by open fireplaces, and the ventilation on Boyle's system, with a central spirette. The latrines and fittings combine all the most recent improvements, and the cost per head for the school buildings and offices works out at £5 13s. 6d. The architect was Mr. E. H. Lingen Barker, of London, Bristol, and Hereford, and the contractor Mr. G. H. Eastwood, of Market Harborough.

SWANSEA.—The new convalescent home in connection with Swansea Hospital has been opened. It consists of three blocks. The centre one is the administrative block, and on either side, approached by open corridors, are two ward blocks—one ward for men and one for women. The accommodation provided in each ward block is a large dayroom, a ward for ten beds, bath-rooms and lavatories, with verandahs running the whole length of the buildings. This accommodates twenty patients. The work generally is of local stone, with brick quoins and rough-cast; the top floor of the administrative block has the walls covered with red Broseley tiles, and all the roofs are covered with terracotta slates. The contract has been carried out by Mr. Griffith Davies. Mr. Daniel Evans has fulfilled the office of clerk of works, and the whole of the work has been designed and carried out under the supervision of Mr. Glendinning Mexham, architect, Swansea.

WEDNESFIELD.—On Friday last the Bishop of Lichfield conducted the dedication service of the parish church, Wednesfield, near Wolverhampton, which has been restored since its destruction by fire in the early part of last year. Drawings were prepared by Mr. F. T. Beck, diocesan surveyor, and the contract was placed in the hands of Messrs. H. Willecock, of Wolverhampton. The

whole of the edifice has been rebuilt, except the main walls of the nave and the tower at the west end, which have been repaired and pointed, and new balustraded parapets erected in accordance with the original designs for the church, prepared at the time of its rebuilding and enlargement about the year 1813, by Messrs. Wyatt and Brandon. A chancel has been added sufficiently spacious to accommodate choir and clergy, seats for whom were formerly in the nave; the organ-chamber has been enlarged, vestries for choir and clergy provided, and a semicircular apse added at the east end. The building is constructed of brick with stone dressings, and the roofs covered with slates. The clock, which was entirely destroyed, has been replaced by a new one by Messrs. John Smith and Sons, of Derby. The total cost is about £5,000.

WORMWOOD SCRUBS.—Mr. Long, the President of the Local Government Board, laid the foundation-stone, on Monday, of a new workhouse and infirmary about to be erected by the Hammersmith Board of Guardians at Ducane-road, Wormwood Scrubs, W. The buildings will stand on a site which is about 15 acres in extent. The infirmary buildings, which occupy the front portion of the site in Ducane-road, facing south, will accommodate, in the first instance, about 350 patients, but are capable of extension so as to afford accommodation for about 600, and comprise official quarters, administrative departments, patients' blocks, and a separate nurses' home. The workhouse is designed to accommodate in the first instance 400 inmates, and it will have sufficient administrative accommodation to allow of an extension for about 800 inmates. A large workshop block is to be erected in proximity to the workhouse pavilions, and also a large laundry common to the two institutions. The architects are Messrs. Giles, Gough, and Trollope, of Craven-street, W.C.; and the builder, Mr. Thomas Rowbotham, of Birmingham. The cost is a little under £200,000.

CHIPS.

The Nantwich Board of Guardians are about to erect an infirmary and nurses' home in connection with the union, at a cost of £6,990.

The new pulpit and window recently erected in the parish church, West Bromwich, were dedicated on Sunday week.

Two memorial windows overlooking the side chapel in St. Mary's Church, Stretton, were unveiled on Wednesday week.

The Willenhall School Board have made a practical move in the direction of technical instruction. A contract has been placed for the erection of a permanent metal workshop and chemical laboratory at the Central School. The metal workshop will cover an area of 53ft. by 20ft., and will accommodate 25 students.

On Tuesday week the corner-stone of the building which is being erected on Church Hill for the Walsall Brotherhood was laid. The cost of the building is to be about £1,600.

The foundation-stones of the Hazel-grove Reform Club was laid on Saturday afternoon by Mr. J. Emmott Birlow, M.P., Mr. T. Carter Bealey, Liberal candidate for the Hyde division, and Mr. F. W. Stoneacre, chairman of the Stockport Liberal Association. The new club when completed will be a handsome building of brick and Portland stone, and will cost about £1,500.

The Hebden Bridge Urban District Council have received sanction from the Local Government Board to borrow £10,230 for their proposed electricity scheme.

Mr. W. D. Carré, M.A., F.S.A., architect to the Ecclesiastical Commissioners, has been admitted to the freedom of the City on the presentation of the Plumbers' Company.

The bells of Lessingham Church, Norfolk, are being rehung. Mr. Augustus Myhill, of Catfield, the leading campanologist in the district, is superintending the work. Solid oak is used for the frame and the gear of the bells. The wrought-iron work is being supplied by Mr. W. R. Draper, of St. Mary's Ironworks, Stalham.

The new post-office at Oundle has been opened. The contractors, Messrs. Siddons and Freeman, invited a few guests and the post-office staff to view the premises.

The Oakwell Joint Infectious Hospital, Birstall, Yorks, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

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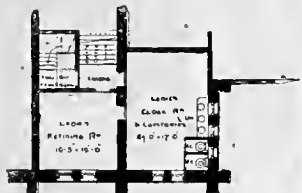
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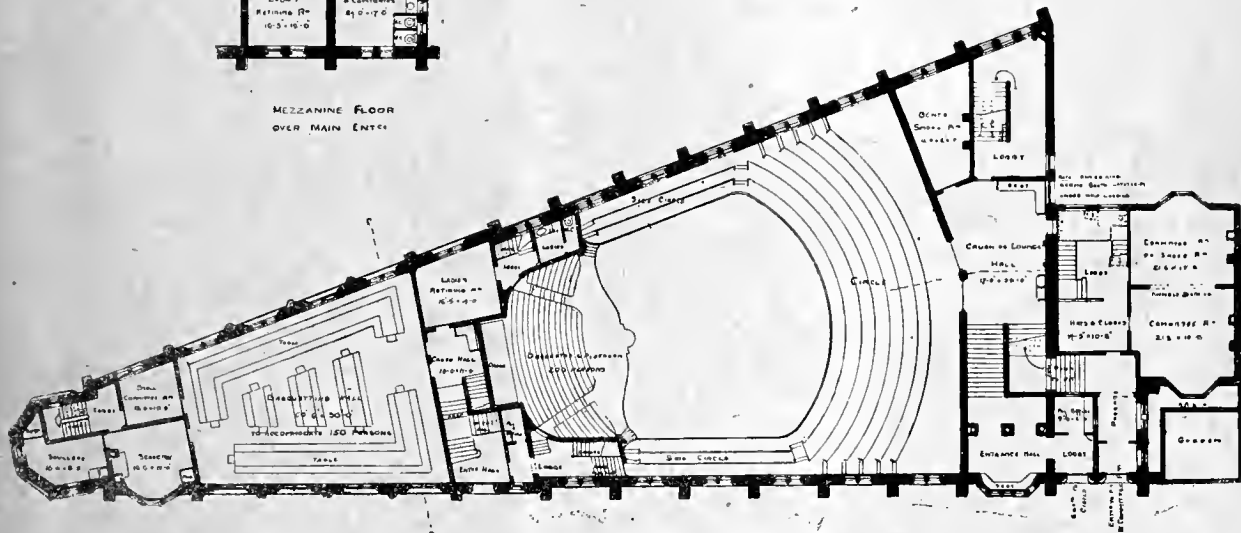
THE VICTORIA HALL, SUNDERLAND.—THE "CROWN AND MITRE," CARLISLE.—LIVERPOOL CATHEDRAL.—R.I.B.A. PUGIN TRAVELLING STUDENTSHIP DRAWINGS—FENTON PUBLIC LIBRARY: SECOND PREMIATED DESIGN—DESIGNS FOR A WAYSIDE TAVERN AND TWO COTTAGES.

Our Illustrations.

SELECTED DESIGN, VICTORIA HALL, SUNDERLAND. This design was selected in open competition, and awarded the first premium by Mr. H. T. Hare, F.R.I.B.A., the assessor. The block



MEZZANINE FLOOR OVER MAIN ENTRANCE



GROUND FLOOR PLAN

VICTORIA HALL, SUNDERLAND.

Newcastle-on-Tyne. The hotel entrance is in the centre of the principal front, with large shops occupying the remainder of the valuable frontage. A commodious assembly-hall is provided at the rear with ample entrances and exits. The frontage is being built with Accrington bricks, with red stone dressings from Cove Quarries, and the roof covered with green Westmoreland slates. The principal contractors are Messrs. Beatty Bros., for the mason work, and Mr. Geo. Black for joiner work. The building has been designed by Messrs. Oliver and Dodgshun, F.F.R.I.B.A., of Carlisle and Leeds, and is being carried out under their supervision. Mr. Thain is the clerk of works.

LIVERPOOL CATHEDRAL.

THIS sheet of details shows the exceedingly refined and admirable character of Messrs. Austin and Paley's design for this building, which was suitably rich without a redundancy of ornament, and, while following precedent, displayed considerable originality and sense of proportion. We have given several illustrations of their design already; but these details of the choir and nave have not been printed before.

PUGIN TRAVELLING STUDENTSHIP DRAWINGS: SKETCHES IN GLOUCESTERSHIRE.

THESE studies are from the pencil of the prizeman, Mr. C. Wontner Smith, A.R.I.B.A., who has favoured us with the accompanying notes respecting the buildings illustrated:—Pershore Abbey is best seen from the N.E., for it is from this point that all that now remains of this famous building, which was contemporary with Gloucester Cathedral and Tewkesbury Abbey, stands revealed. The Norman nave has entirely gone, and also the north transept, so that practically all that is left is the choir, south transept, and tower. This view also shows the enormous buttresses which it was found necessary to erect in order to preserve the stability of the tower.

exhibiting work of all styles, from Norman to Perpendicular. The tower, which stands at the east end of the south aisle, though simple in character, is greatly helped by the beautiful colour of the stonework and the rich embattled parapet.

FENTON PUBLIC LIBRARY: SECOND PREMIATED DESIGN.

WE gave the first premiated design in this competition on July 17; to-day we illustrate the second prize design, chosen out of over eighty others by Mr. Ernest George, who acted as professional referee. It is interesting to compare these two prize designs, and it remains open to question as to whether out of all the large number of plans sent in these two were really the best library plans submitted, taking into account, of course, the money limit, and other conditions. If so, this competition cannot be said to have been distinguished, architecturally, for merit, or for intimate knowledge of the practical requirements of library arrangement. Mr. Stephenson Stout, Whitehaven, is the author of this scheme.

"BUILDING NEWS" DESIGNING CLUB: A WAYSIDE TAVERN AND TWO COTTAGES.

(For description and awards see page. 130.)

CHIPS.

The addition of Heaton Park to the open spaces of Manchester has more than doubled the area of the city parks. Of the 1,103 acres devoted to parks, open spaces, and recreation grounds, 692 are in this latest acquisition, Heaton Park.

The foundation-stones of a new Primitive Methodist church and lecture-hall, which is to be erected in Southfield-road, Middlesbrough, were laid last week. On the ground floor there will be a lecture-hall 52ft. by 34ft., with an infants' classroom, tea-room, and staircase behind. The school above will be 30ft. long by 25ft. broad. There will be five

comprises a large hall with galleries and dress-circle to seat about 3,000 adults. This hall has in immediate connection retiring rooms for chorus and soloists, with lavatories. There is also a smaller hall to seat 700 adults. Both halls are fully provided with cloakrooms and lavatories for ladies and gentlemen. There is also a large banqueting hall, with kitchens, sculleries, services, &c. Both halls will be elaborately decorated. The buildings will be built of special red bricks, with all the dressings of stone; the roofing will be of green Westmoreland slates. Mr. John Eltringham, of Sunderland, is the architect.

NEW HOTEL AND ASSEMBLY ROOMS, CARLISLE.

THESE new buildings are being erected in the Market-place, Carlisle, for Mr. Walter Scott, of

Shipton Court is typical of the larger houses to be found in the Cotswold district. It is extremely picturesque with its high-pitched gabled roofs covered with stone slates, which have weathered to a beautiful colour. This sketch only shows one wing of the house, which has recently undergone some restoration. Campden Church is one of the finest in the district. Chipping Campden was formerly a place of some importance, being in the 14th and 15th centuries the principal market for wool. Many rich wool merchants lived here, and it was no doubt owing to their munificence that this fine church was built. The tower is the most interesting feature of the church, and the curious treatment of carrying one of the buttresses down in front of the west window is worthy of notice. Stow in the Wold, some few miles away, also contains a fine church

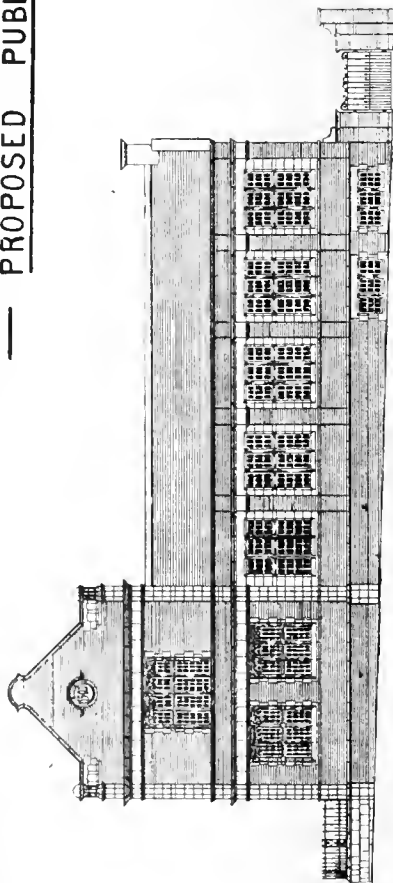
classrooms, one being 29ft. by 12ft. The building will be of brickwork, faced with Normandy bricks, with dressings of Closeburn stone, and the roof will be covered with Welsh slates. The lecture-hall will accommodate 300 people. Mr. Henry Walker, of Linthorpe, is the contractor, and the architect is Mr. T. E. Davidson, of Newcastle.

The new Catholic Church of St. Peter, at South Bank, the foundation-stone of which was recently laid by Bishop Lacy, Middlesbrough, will cost over £7,000 and seat 700 persons. Of Gothic design, it will be 115ft. long and 66ft. broad, with a tower 80ft. high.

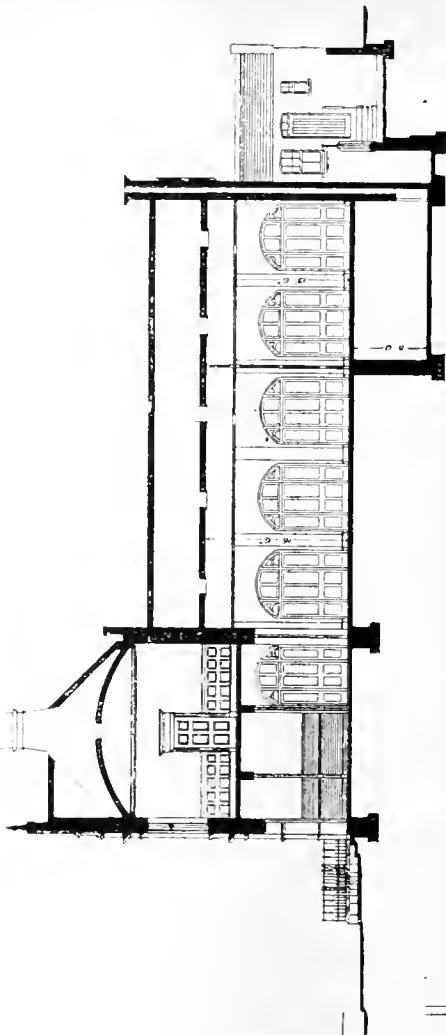
A report has been prepared by the museums sub-committee of the Burnley Corporation recommending the council to take into consideration the formation of a permanent art exhibition at Towneley Hall, in place of the loan collection recently opened by Lord Rosebery.

FENTON URBAN DISTRICT

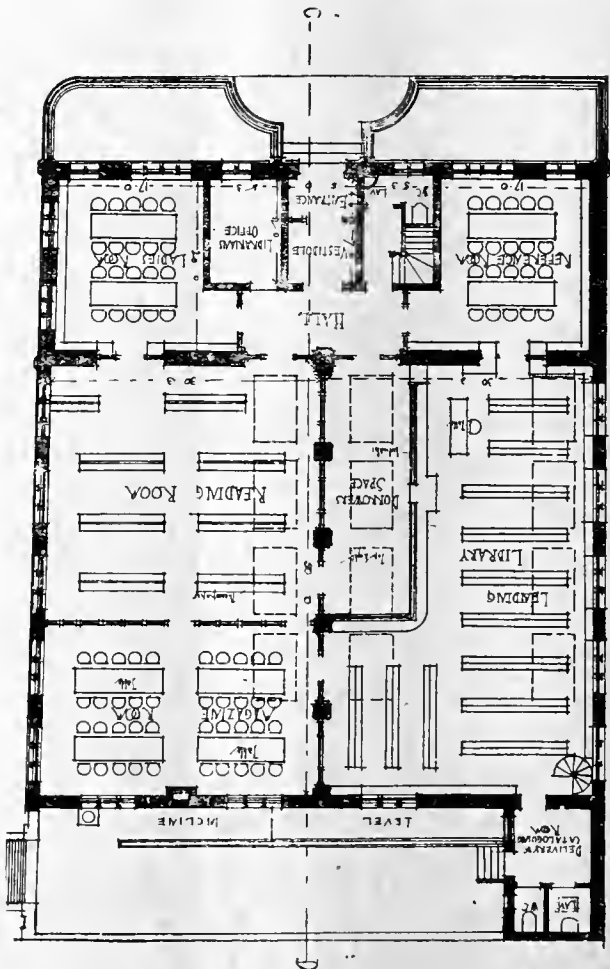
PROPOSED PUBLIC LIBRARY



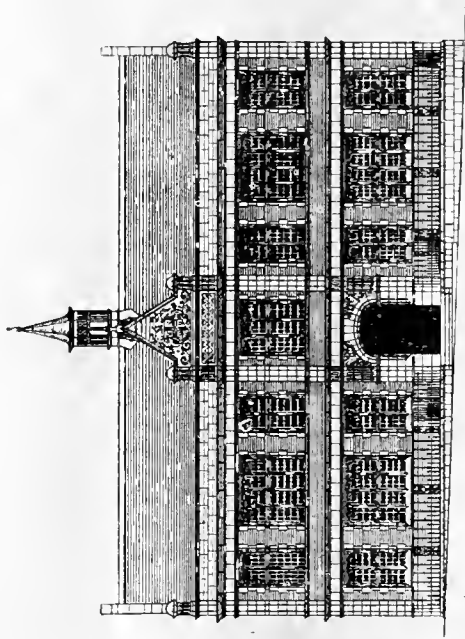
Elevation to Baker Street



Section on C.D.

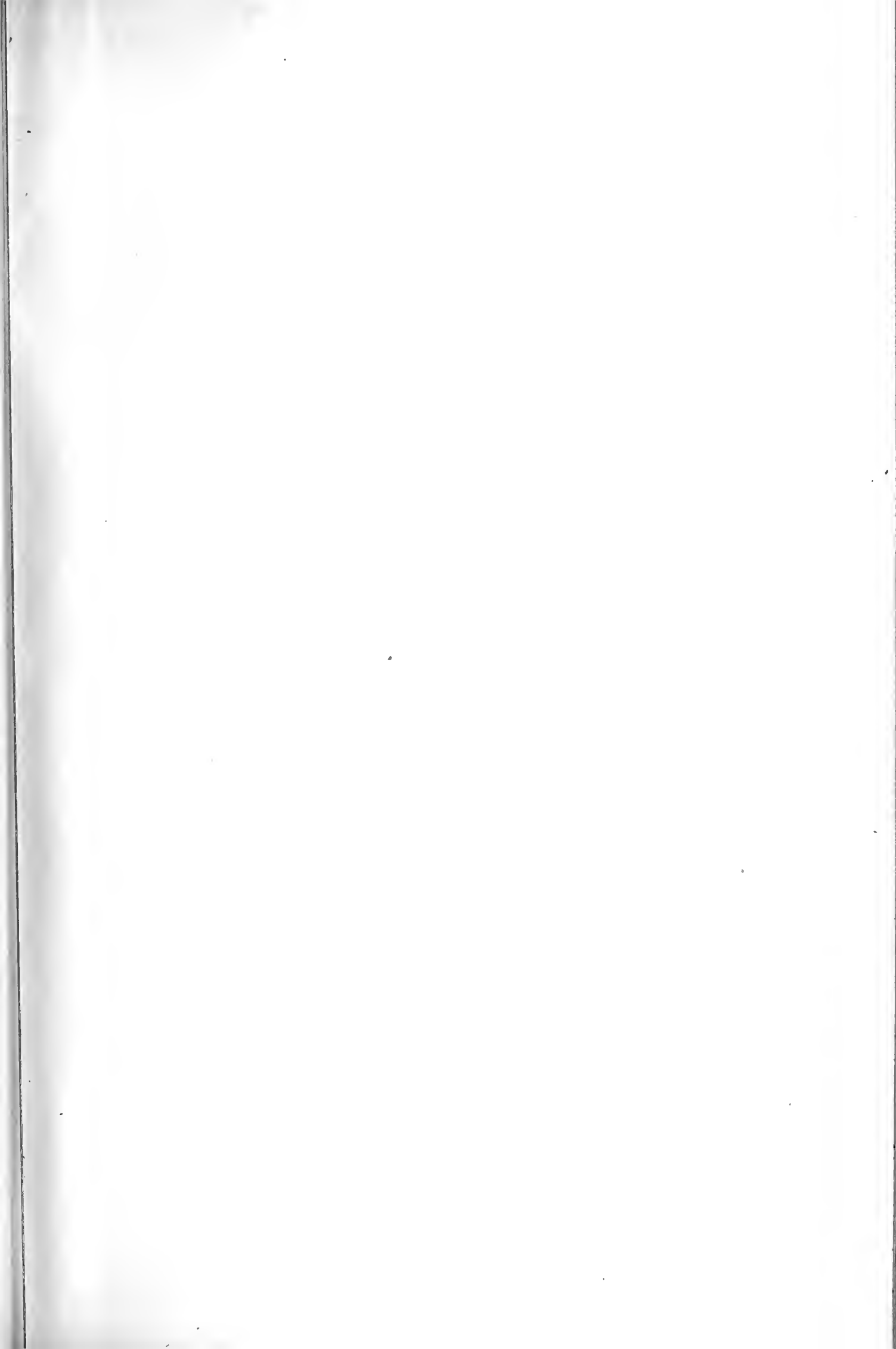


GROUND PLAN



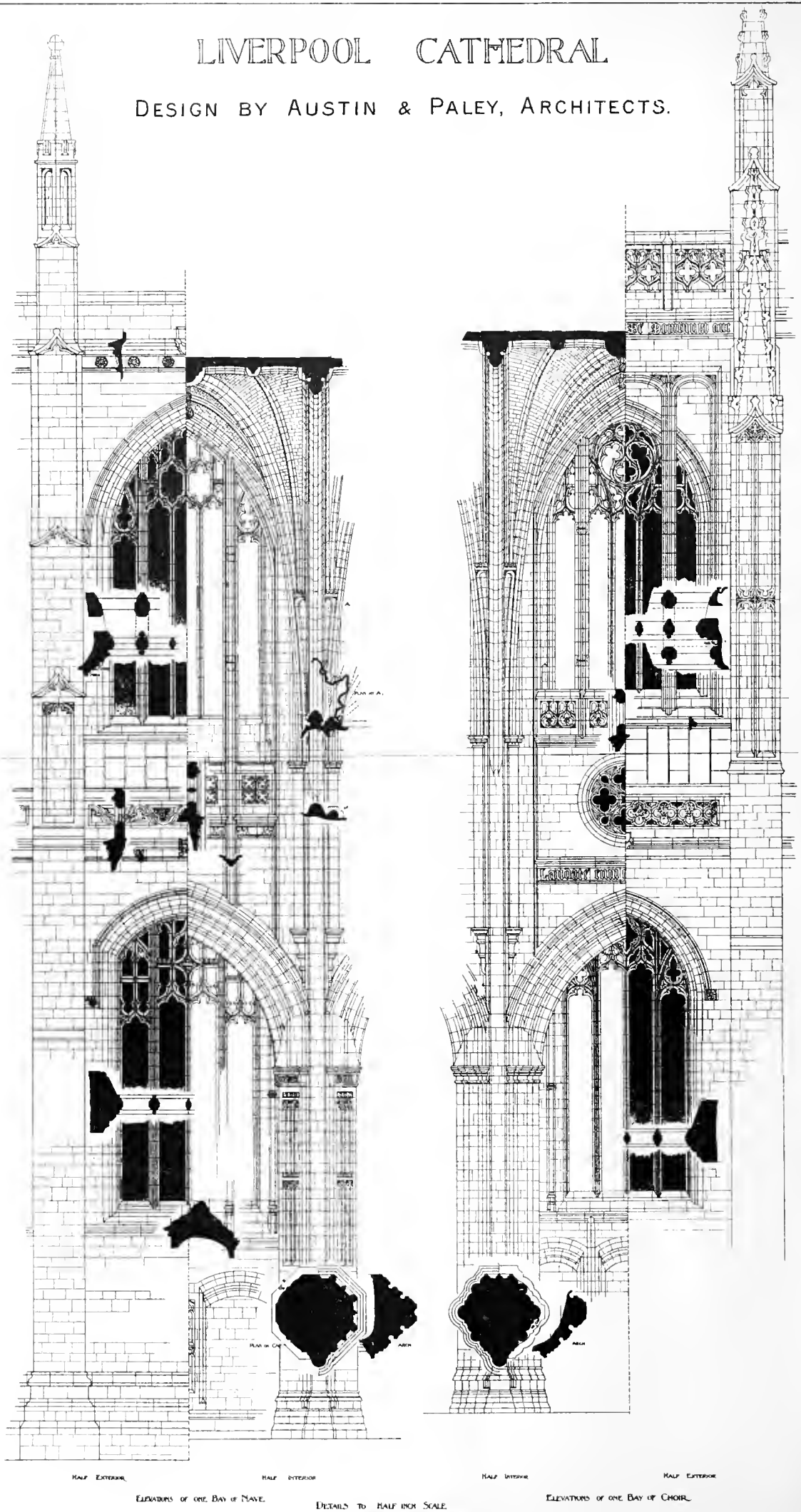
Elevation to Station Road





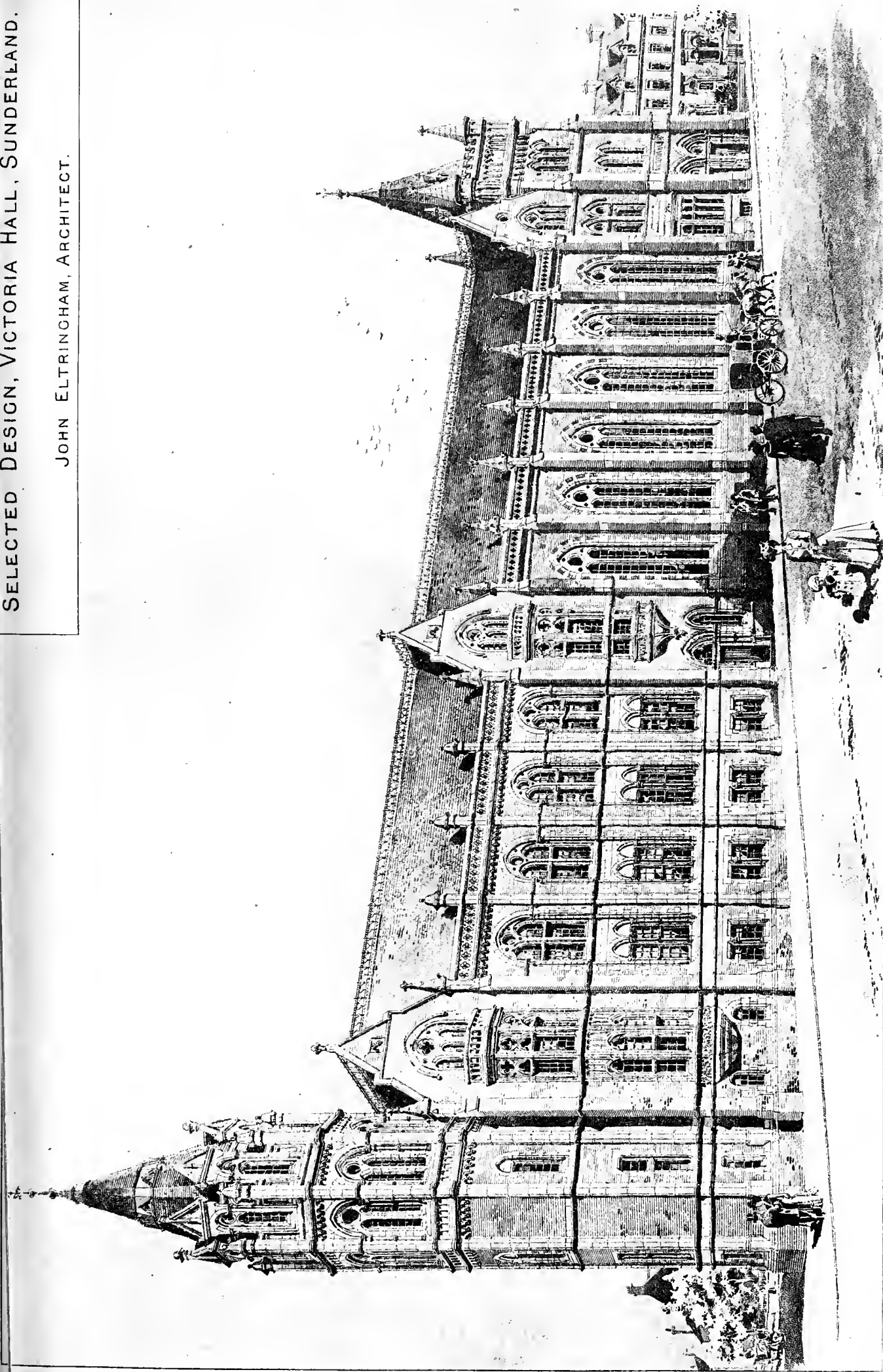
LIVERPOOL CATHEDRAL

DESIGN BY AUSTIN & PALEY, ARCHITECTS.

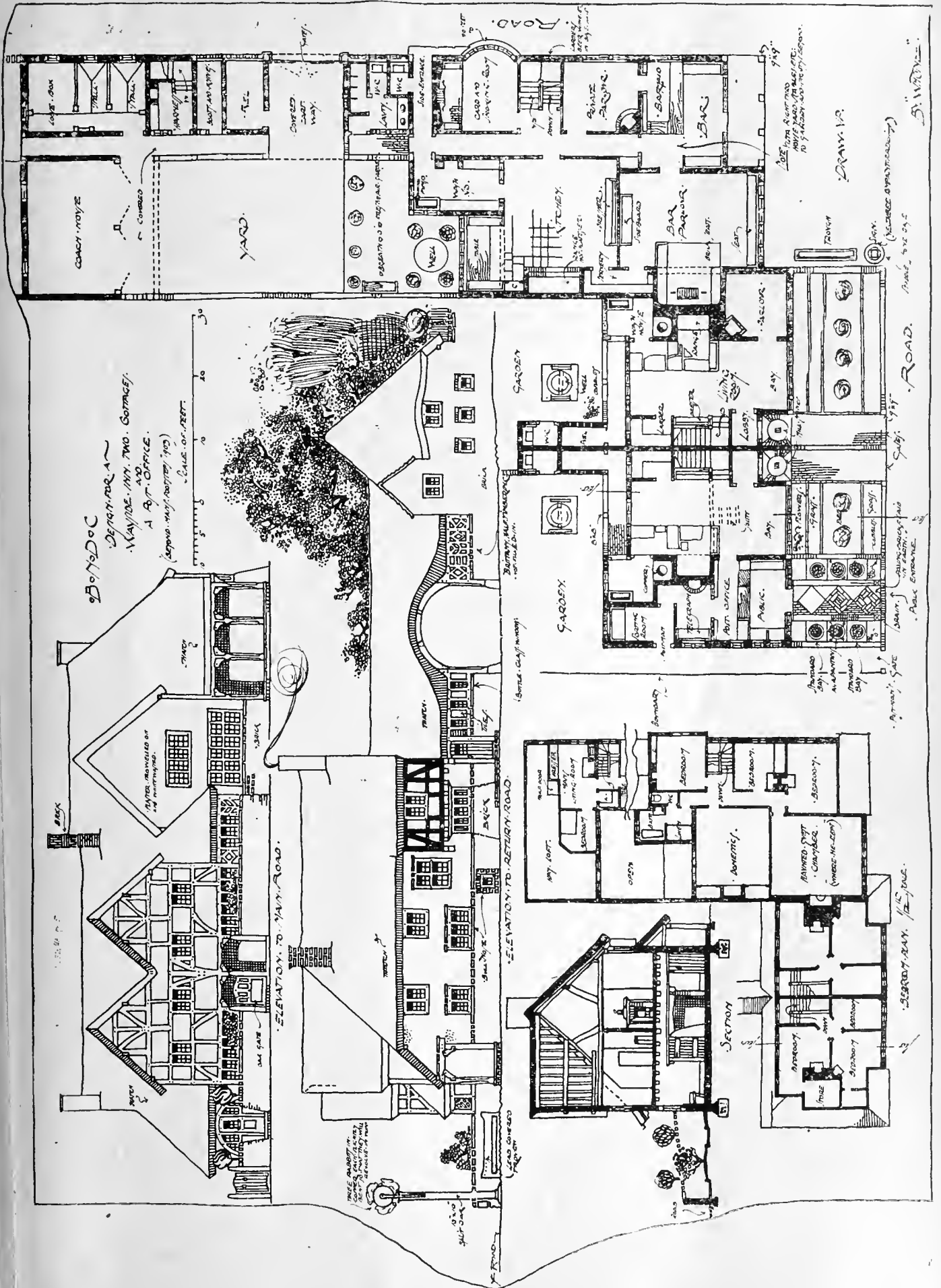


SELECTED DESIGN, VICTORIA HALL, SUNDERLAND.

JOHN ELTRINGHAM, ARCHITECT.







TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.V., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XLII., XLVI., XLIX., LIII., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—F. G. J.—R. M. T.—B. J. R.—H. M. W.—K. B. C.—W. A. T.—L. P. C.

Correspondence.

ALLHALLOWS', EXETER.

To the Editor of the BUILDING NEWS.

SIR,—In your last issue you refer to a paper on "Allhallows', Goldsmith-street, Exeter," read by "Mr. E. Harbottle Reed, diocesan architect." May I point out that there is no "E." before my name, and also that there is no diocesan architect? I noted the history of the church from 1194, not 1581.—I am, &c.,

HARBOTTLE REED.

12, Castle-street, Exeter, July 29.

VANDALISM AT STRATFORD-ON-AVON AND ELSEWHERE.

SIR,—It seems somewhat surprising that Miss Corelli has not received more support from the architectural profession during her crusade at Stratford. The demolition of the old cottages, against which she protests, and the substitution of a large modern red brick and stone library upon their site, will undoubtedly produce an

incongruous effect, and in a pastoral town like Stratford, where immediately off the main streets land for the new library can be bought upon very reasonable terms, it really does seem a pity to needlessly destroy the delightfully old-world appearance of the present town. As an example of the injury which may be done by a good building when placed in a wrong position, I would name the huge red-brick structure erected some years since within the precincts of the Tower of London. This structure is utterly at variance with the whole of its surroundings, and its modern heights and proportions make the old Mediaeval buildings of the Tower look almost like toy buildings. Previously the Tower had been described as the most interesting Mediaeval fortress in Europe. Although aware that "a writer that overstates his case weakens his own argument," I, nevertheless, seriously assert that the erection of the building—to which I have referred—in its present position is as much an act of vandalism as would be the addition of a wing in the form of a red brick board school to Westminster Abbey, and if a few of our leading architects would form a small committee and inspect this structure, I am satisfied that they would favour the presentation of a petition to the Government for its removal.—I am, &c., F.R.I.B.A.

CHIPS.

The salary of Mr. J. W. Walshaw, the city surveyor of Peterborough, has been raised by £100 a year.

The new Lancashire Inebriates' Home, Langho, near Preston, has a new illuminated clock striking the hours, and showing the time on four external dials, erected in the tower, the work having been executed by Messrs. Wm. Potts and Sons, clock manufacturers, Leeds, who are now erecting a new illuminated clock for Messrs. Horrockses and Crewdson, Limited, Preston, and have just completed a new clock at the Normanby Estates Offices, Lincolnshire, for Sir Berkeley Sheffield, Bart. All the above are from the designs and plans of Lord Grimthorpe.

Euston Hall, Suffolk, the seat of his Grace the Duke of Grafton, K.G., which was almost entirely destroyed by fire in the spring of last year, is being rebuilt. Externally, the general lines and character of the old buildings are to be maintained; but internally the arrangements have been remodelled to meet present-day requirements. The works are being carried out by Mr. Thomas Heath, of London and Towcester, under the directions of Mr. W. H. Atkin Berry, F.R.I.B.A., of the firm of Kidner and Berry, London.

A co-operative society formed at Plumstead has just acquired 150 acres on the Bostall Heath Estate, on which a new town is to be built; 3,500 houses will be laid out in streets. A peculiarity of the new town will be the absence of churches of any kind, the committee having resolved not to grant sites for any kind of ecclesiastical building in connection with any denomination whatsoever.

On Sunday afternoon, Col. Gallwey, C.B., commanding the 13th Regimental District, unveiled the tablet which has been erected in the parish church to the memory of the Crewkerne soldiers who fell in the war. The memorial is constructed, in the main, of polished English alabaster, resting upon a background of Cornish polyphant. It is surmounted by a pediment, in turn resting upon pilaster columns. The actual slab, of white marble, upon which the names occur is carved to imitate a Union Jack. In the centre of the pediment is a Royal Crown, and the dates of 1899 and 1902 interwoven with laurel leaves on a polished base. Below the names is the motto, "Dulce et decorum est pro patria mori," whilst upon the face of the pilasters occur each hero's initials and the date and place of their respective deaths. Standing on each side, with arms reversed and resting on their guns, are sculptured statues of soldiers in fighting uniform. The work was executed by Messrs. Harry Hems and Sons, of Exeter.

Messrs. Hems and Sons, of Exeter, are engaged in their studios at Exeter upon a new reredos destined for Crewkerne Parish Church, in which a representation of the Last Supper will be introduced and form the central panel. It will be placed in position in September next.

At a meeting of the Newcastle-under-Lyme Town Council on Tuesday evening amended estimates for the sewage disposal works were submitted by Mr. Wilcox, of Birmingham, the engineer for the scheme, amounting to £20,325, which, with the purchase of the necessary land, made the total estimated cost of the scheme £25,800. The estimates were approved, and the town clerk instructed to apply to the Local Government Board for sanction to borrow the amount named.

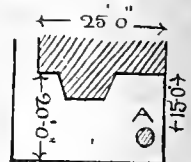
Intercommunication.

QUESTIONS.

[11993].—Payment of Architect.—A client for whom I prepared plans, specifications, and quantities and obtained tenders (one of which he provisionally accepted) has been unable to further proceed with his buildings owing, apparently, to shortness of money. On pressing him for payment, he requests the return of all plans, specifications, and other documents, though I have not yet received anything in payment from him. Am I justified legally in withholding these until my account is paid, or, at any rate, a substantial payment on account? I offer to give them up on settlement of my charges.—W. A.

[11994].—Shifting River.—A tidal river has altered its course about 100 yards after a flood, and has blocked up a village sewer outlet. What is the most practical method of diverting the river back into its former bed?—X.

[11995].—Tree and Foundations.—What disadvantages would there be in leaving the tree marked A?



Would there be any danger to the foundations of house Foundations of house are taken 3 or 4 ft. below surface of ground. When excavating foundations, roots were cut (one root, 4 in. or 5 in. dia.). Tree, a full-grown elm, 38 ft. high over all; trunk, 18 in. dia.—H. G.

CHIPS.

At a meeting of the Gillingham (Kent) Education Committee, held on Tuesday week, the building sub-committee recommended that competitive plans should be advertised for in respect to the proposed new schools at Napier-road, the total cost of the building, &c., not to exceed £7,500.

The council of the Society of Arts attended at Marlborough House on Monday, when the Prince of Wales, as president of the society, presented the Society's Albert Medal to Sir Charles Augustus Hartley, in recognition of his services, extending over forty years, as engineer to the International Commission of the Danube, which have resulted in the opening up of the navigation of that river to the ships of all nations.

The Countess of Jersey, on Monday evening, laid the foundation-stone of the new free library in Clifden House Grounds, Brentford. Mr. Nowell Parr, the architect, presented a silver trowel and ebony mallet to the Countess.

The Streets and Buildings Committee of Edinburgh Town Council agreed last Friday to recommend the acceptance of estimates amounting to between £4,000 and £5,000 for the reconstruction of the Princes-street Gardens sewer.

The Mayor of Kingston-on-Thames, on Saturday, unveiled, in the Town Hall, a stained-glass window, bearing, amongst other arms, those of King James I. of England and his Queen, Anne of Denmark, the day being the 300th anniversary of the crowning of those Monarchs. The window was originally in the old Town Hall, and after its transference to the new Town Hall it was found necessary to have it renovated, so as to bring it into uniformity with other old stained-glass windows in the building.

A stained-glass window in memory of Dr. J. C. Ryle, first Bishop of Liverpool, was unveiled last week in Emmanuel Church, Southport, by Mrs. Denton Thompson. The window has two subjects—"The Preaching of the Word" and "The Laying on of Hands."

A marble bust of the late Sir Henry William Flower, F.R.S., Director of the Natural History Department of the British Museum, was formally presented to the Trustees of the British Museum by the Flower Memorial Committee, at the Natural History Museum, South Kensington, on Saturday and the Archbishop of Canterbury unveiled it. Mr. T. Brock, R.A., is the sculptor.

Recent building excavations in Vienna have resulted in discoveries of Roman antiquities, notably Roman roof and ceiling tiles, bearing the imprint of the 10th and 14th legends, and coins with the image of the Emperor Constantine (fourth century A.D.). At a depth of 3 ft. a Roman road was laid bare.

The foundation-stone of a new Wesleyan church was laid at Newquay last week. The new church will be situated in the main street, and will cost together with the site, about £10,000. Seating accommodation in the church will be provided for 700 persons, while the schools will be capable comfortably holding 300 children. Messrs. Matcha and Co., Plymouth, are the builders, and Messrs. Withers and Meredith, Launceston, the architects.

LEGAL INTELLIGENCE.

MODEL DWELLINGS AND VENTILATING PIPES.—The National Model Dwellings Company, owners of Queen's Buildings, Borough, were summoned the other day by the Southwark Borough Council for non-compliance with notices served under the bylaws. There were 13 summonses in all, eight relating to the provision of ventilating pipes, and the remainder to sanitary repairs. Mr. Holden, who defended, asked that the first eight be adjourned pending the decision in a similar case taken to the High Court by the owners of Ponsonby Buildings, Southwark. The same points would arise. With regard to the other summonses, the work was practically completed. The magistrate adjourned the eight summonses, and on the others ordered the defendants to pay £5 fine and 10s. costs.

PRECAUTIONS AGAINST FIRE IN FACTORIES CONNECTED BY BRIDGES.—IN THE MATTER OF AN ARBITRATION BETWEEN THE LONDON COUNTY COUNCIL AND TUBBS. —In this case, Mr. Bodkin, barrister, who is the umpire in an arbitration between the County Council and Henry Thomas Tubbs, stated a special case raising a point of law for the consideration of the High Court, and judgment was given recently in the King's Bench Division by the Lord Chief Justice, Mr. Justice Wills, and Mr. Justice Channell. Mr. Tubbs was the owner of Nos. 8 and 9, Lonsden-place, and in 1892 he let No. 9 to Messrs. Fordham and Co., photographic mount manufacturers, and in 1899 he let No. 8 to the same firm. Both of the houses had two entrances, and in No. 8 there was engine power for working machinery which was in use in the house. There was no internal connection between the two houses at all, but on the first floor there had been erected a small bridge or covered way, over which there was a good deal of traffic between the two houses, and which ran from window to window. The premises were used by Messrs. Fordham together in this sense, that some of the work which was done by means of mechanical power in No. 8 was afterwards taken into No. 9 and dealt with. Under these circumstances, the County Council had served upon Mr. Tubbs a notice, under the Factory Act, of 1901, requiring certain precautions to be taken against fire in regard to both houses, which they treated as one factory. Mr. Tubbs admitted that No. 8, regarded by itself, was a non-textile factory, but denied the right to include No. 9 in their notice merely because of the gangway connecting the two premises. On the other hand, the Council said that the premises were one factory, and should be treated as such in regard to precautions against fire. The umpire was of opinion that 8 and 9 were one factory within the meaning of the Act, and Mr. Tubbs now appealed. The Lord Chief Justice said the premises being used as they were, and the persons employed being able to pass from one building to the other, and the process carried on being one process, the Court did not, under all the circumstances, consider that they could interfere with the umpire's finding. The other Judges concurred, and the appeal was dismissed.

NORWICH BUILDER'S FAILURE.—ESTIMATED SURPLUS.—*Re* Charlotte Porter (wife of Henry Earle Porter), residing at Park-lane, Norwich, rickmaker and building estate proprietress, carrying on business separately from her husband at Park-lane, at Sprawston Brick Works, School-lane, and Roman Hill Brick Works, Lowestoft. Gross liabilities £49,046 12s. 2d., estimated surplus £915 10s. 10d. The Official Receiver last week said he had received a medical certificate, stating that the debtor could not be present that day, and the examination was adjourned till the next Court.

RIGHTS OF OWNERS ADJOINING "OPEN SPACES."—*BOYCE V. THE PADDINGTON BOROUGH COUNCIL.*—his was an appeal heard last Saturday against the decision of Mr. Justice Buckley. The case was thus summarised in the judgment of the learned Judge: "When stripped of all technicality, the question to be determined in this action is whether the owners of land circumscribed and abutting upon other land which has become an open space within the Metropolitan Open Spaces Acts, 1877, 1881, and 1887, and the Disused Burial Grounds Act, 1884, became at once, by virtue of those Acts, or must be allowed to become, after the period of the Prescription Act, by the use of an enjoyment which cannot be excluded the erection of a hoarding, entitled as of right the access of light to the windows of any buildings which they may erect contiguous to the open space. The open space in question is the disused burial-ground of St. Mary's, Paddington. The plaintiff has recently erected a large block of premises immediately abutting upon that open space, with numerous windows overlooking it. The defendants contend that they are entitled to erect a hoarding or screen in front of those windows so as to preclude the plaintiff from prescribing for rights of light. The plaintiff says they are not so entitled, and asserts his case upon two grounds. He says, first, that he, as a member of the public, is entitled to insist that the space shall be an open space; from which it results that there will be free access of light to his windows; and, secondly, that

whether this is so or not, the defendants cannot erect a hoarding so as to prevent his becoming entitled by prescription, because they are by the relevant Acts of Parliament forbidden to erect any building, temporary or movable, except for the purpose of enlarging the church. A hoarding erected for the purpose of preventing the acquisition of a prescriptive right to light is, he says, a building. Under section 1 of the Metropolitan Open Spaces Act, 1877, an open space, when acquired under the Act, is to be held "in trust for the perpetual use thereof by the public for exercise and recreation." By section 4 of the Open Spaces Act, 1881, power is given to transfer any churchyard, or the control of it, within the metropolitan area, closed for burials, to the local authority "for the purpose of giving the public access" thereto and "preserving the same as an open space accessible to the public." And by section 5 the local authority is to hold and administer the property "in trust to allow, and with a view to, the enjoyment by the public of such open space, churchyard, cemetery, or burial-ground in an open condition free from buildings, and for no other purpose," and power is given to "inclose or keep the same inclosed with proper railings and gates." By section 3 of the Disused Burial Grounds Act, 1884, "it shall not be lawful to erect any buildings upon any disused burial-ground, except for the purpose of enlarging a church, chapel, meeting-house, or other place of worship." The freehold of the land is vested in the vicar. The defendants objected that the plaintiff could not maintain the action without the concurrence of the Attorney-General. Mr. Justice Buckley overruled this objection, holding that the plaintiff was claiming a private right distinct from the right which he had in common with the rest of the public. He claimed upon the footing that he had a right to the access of light to his windows, and, therefore, was suing in respect of a private, not a public, right. If, however, he was suing in respect of his right as a member of the public to say that no building should be put on the land, and the hoarding was a building, he would be personally suffering special damage from the breach of the public right, and could, therefore, sue without adjoining the Attorney-General. His Lordship, therefore, held that the action was well constituted; but he decided against the plaintiff on the ground that he had not the right which he claimed. His Lordship said that the Acts did not contemplate the creation of any consequential rights in the neighbouring owners. The space was to be opened for the public purposes for which it was to be enjoyed—viz., for exercise and recreation. It was not to be open so as to create rights in favour of adjoining landowners. The plaintiff's contention really was that he had a right which would be a private right, because there was another and a different public right. His Lordship was of opinion that a hoarding put up to prevent the plaintiff from acquiring prescriptive rights was not a building within the meaning of the Acts. His Lordship came to the conclusion that the plaintiff had not by virtue of the Acts acquired the easement which he claimed, and that the defendants were not by the Acts precluded from erecting such a hoarding as was necessary to prevent him from obtaining the benefit of the Prescription Act. The action was accordingly dismissed. The plaintiff appealed. The hearing of the appeal was begun on May 6th. Before the argument on behalf of the plaintiff had been concluded the Court intimated that it was desirable in the interests of peace, and having regard to the fact that the defendants are a public body, that the matter should be settled between the plaintiff and the borough council; and they suggested terms of settlement—viz., that the plaintiff should give an undertaking that he would not claim any prescriptive right to light by reason of the hoarding not being erected, and that the defendants should undertake not to erect the hoarding. The plaintiff was willing to give the undertaking proposed on his part, and the appeal was ordered to stand over for the purpose of ascertaining whether the borough council would be willing to give the undertaking proposed on their part. It afterwards appeared that the council were not prepared to give the proposed undertaking, and the appeal now came on again in order that the arguments might be concluded. Their Lordships having intimated that the Attorney-General ought to be made a party to the action in respect of the rights of the public, the Attorney-General authorised the use of his name, and the pleadings were amended accordingly, so as to make the Attorney-General, at the relation of Mr. Boyce, and Mr. Boyce co-plaintiffs. The Court allowed the appeal. Lord Justice Vaughan Williams said that the vicar as such took no part in the threat to erect a screen, and there was therefore no cause of action against him, and the action as against him must be dismissed. The order of the Court below giving him costs would not be altered; but, having regard to the position which he had taken up in the Court of Appeal, he would have no costs of the appeal. As regarded the borough council, their statement of defence contained the following passage:—"The action of the defendant council in threatening to

erect the said screen has been taken solely in performance of their public duty as trustees by virtue of the said Acts, and the sole purpose of erection was to prevent the plaintiff, as the owner or occupier of land adjoining the said churchyard, from acquiring any rights of light or air which would diminish or injuriously affect the enjoyment by the public of the said churchyard as an open space." His Lordship referred to the sections of the different Acts which are above mentioned, and said that in his opinion the council had no right to erect the screen for the purpose which they stated. To do so would be inconsistent with their duties under the statutes. They would be holding and administering the open space otherwise than with a view to its enjoyment by the public. Quite apart from the express prohibition of the erection of any buildings, his Lordship thought that the erection of the proposed screen did not come within the power or authority given to the council by the statutes. Moreover, his Lordship was not disposed to read the word "building" in the limited sense in which Mr. Justice Buckley had read it. An injunction must be granted to restrain the council from using the open space in any other manner than that which was specified in section 5 of the Act of 1881, and in particular from erecting a screen as was proposed, but this would not prevent the council from inclosing the space with proper railings and gates. The council would be relieved from paying costs in the Court below; but no costs would be given to them in that Court, and they must pay the plaintiff's costs of the appeal. Lord Justice Romer concurred. Lord Justice Cozens-Hardy also agreed. He did not base his judgment on the question whether the screen was or was not a "building." Under the statutes the council had control over the open space for strictly limited purposes, and it was not competent to them to use their powers for the purpose of compelling a neighbouring landowner to give them a right of way or preventing him from acquiring any rights.

BUILDING DISPUTE.—At Leeds Assizes on Monday, before Mr. Justice Grantham, John Hobson, joiner, of Domestic-street, Holbeck, Leeds, sued Joseph Hunt, of North Park-road, Roundhay, Leeds, for £113 10s., the balance of account for work done. Mr. Macaskie, in opening the case for the plaintiff, said his client was a builder who erected houses and then sold them, but who did not do contract work. In 1901 he bought a piece of land at North Park, Roundhay, intending to build a house for himself. The defendant, who was a friend of the plaintiff, had also a piece of ground immediately adjoining, on which he, too, intended to have a house built. He advertised for tenders, and asked the plaintiff to tender among the others, but, as this was not in Hobson's line, the latter declined. The tenders were higher than Hunt expected, and he again asked the plaintiff to tender. Eventually, as both houses were together, the plaintiff undertook to build Hunt's house at cost price. The question of the joinery work came up, and the plaintiff was asked to do it for the same sum as the lowest tender, £245, but this he refused, saying he would do it at cost price. The point at issue was whether the plaintiff had agreed to do the whole of the work at cost price, or whether, as the defendant alleged, he was to do the joinery work at the lowest tender, and any question of extras was to be left to the defendant's son to decide. The jury found for the plaintiff, holding that there was no contract, but that the plaintiff was not entitled to commission. The amount to be paid is to be decided elsewhere.

CHARING CROSS AND HAMFSTEAD RAILWAY.—Mr. H. T. Steward sat at the Surveyors' Institute, Westminster, on Tuesday to hear the case of "Ruffin v. the Charing Cross, Euston, and Hamstead Railway Co.," it being a claim for compensation for the compulsory acquisition of the claimant's interest in the premises, 74, Tottenham Court-road, required for the purposes of the new railway. Mr. Courthope Munroe appeared for the claimant, a lady carrying on the business of a pastrycook, and Mr. Roskill, K.C., represented the company. Mr. Munroe informed the arbitrator that his client had agreed to accept the sum of £1,500 in satisfaction of her claim. The arbitrator said he would make his award in accordance with the terms of the amount agreed on.

WOOLWICH ARSENAL EXTENSION.—At Westminster on Tuesday, before Mr. R. Clutton, sole arbitrator, a claim for compensation, amounting to £6,000, was heard against the Secretary of State for War, in respect of about 20 acres of land which the War Office have compulsorily acquired from a Mrs. Dashwood in connection with the extension of Woolwich Arsenal. Mr. Rawlinson, K.C., and Mr. Ricketts appeared for the claimant, and the Solicitor-General (Sir E. Carson, K.C., M.P.) and Mr. Sutton represented the War Office. Mr. Rawlinson stated that the land was a valuable building site, and was suitable for the erection of factories or workmen's dwellings. It had an area of 20 acres, and he put the value per acre at, roughly, £300. One plot was let on a yearly tenancy with other land for £25 a year. Expert witnesses called for the claimant put

the value of the property at figures ranging from £2,951 and £3,000 to £6,000. The Solicitor-General submitted that £150 per acre placed on the land by several of the witnesses was very much too high, and that it was wrong to place the same value on the two plots of land in question, one of which had a frontage and the other had not. The War Office experts called estimated the value at from about £1,590 to £1,650. The arbitrator reserved his award.

WATER SUPPLY AND SANITARY MATTERS.

HUGE DRAINAGE SCHEME.—The conservators of the River Lea have been much troubled with pollutions of a serious character, one of the chief causes being the sewage farms along the river valley. With a view to remove this difficulty, which forms a fertile source of danger to health, surveys and plans have been made showing how a joint drainage sewer of the various urban and other authorities would meet the object. Sir Alexander Binnie has approved of the proposal, and the conservators are asking the various local authorities concerned to adopt the scheme. It is a huge one, and the cost would no doubt run into seven figures; but so much Lea water is used by water companies that some action is necessary in the interest of public health.

WOLVERHAMPTON.—The annual report of Dr. Malet, the medical officer of health for Wolverhampton, just issued, states that the sanitary condition of the borough has in the past few years materially improved in several directions. Much unhealthy property has been closed; some of it has been demolished, leaving more open space; thousands of defects, each one, perhaps, trivial in itself, but contributing to the general air contamination, which is the essential unhealthy element in a town, have been remedied; many new and open streets have been built. All these things have rendered the town as a whole healthier, and the lower death rate is in part at least due to this. Much, however, remains to be done. In the eastern district there are very many houses so crowded in courts as to be unhealthy themselves, and by their obstruction to cause other houses to be also unhealthy. Much of the house property in the older parts is so badly constructed, or so worn out, as to need constant attention to keep it reasonably dry. Not a little of the house drainage throughout the town is seriously defective. It is doubtful if the water supply is sufficient. Some new streets have far too little back-air space. As to the directions in which sanitary work could more effectively be carried on, Dr. Malet instances the extension of the water supply, the provision of a destructor, the extension of the borough hospital for diphtheria and enteric fever, and the general assisted conversion of pail closets to water carriage under the provisional order.

At a meeting of the Royston Surveyor's Committee, on Monday, the tender of Mr. John Lewis, of Rochdale, for brickwork at the sewage outfall works was recommended for acceptance, and this the council approved. The tender of Messrs. Mather and Platt for automatic spreaders for sewage treatment was also approved, on the committee's recommendation.

The scheme for the erection of a Liverpool memorial to the Rev. Charles Garrett has now taken definite shape, and an appeal is being made for funds. On the site in Renshaw-street a central hall to seat 2,500 and a smaller hall to seat 750 are to be erected at a cost of £35,000. To the Boys' Home in Shaw-street, which forms part of the mission of which Mr. Garrett was superintendent, a night shelter and training home are to be added at a cost of £3,000.

The new lectern which the children of St. Mark's, Salisbury, have given to their church for their Lady-chapel is carved in walnut from designs by the architect, Mr. A. J. Reeve, and is noticeable as being of the unusual but correct form of a "reading pew," rather than a mere book-rest on a pedestal. The carving has been done by Mr. Noyes, of the cathedral choir, and the design is a cross in open panels, with a circlet about the arms.

The Lord Mayor of Sheffield, who recently refused to pay the education rate, on Monday objected to the employment of nude models at the Sheffield School of Art.

Alfred John Hartill, plumber and gasfitter, 4, Worcester-street, Wolverhampton, was examined at the Wolverhampton County-court on Monday, before Mr. Registrar Kettle. The liabilities were set down at £318, and the assets at £61. In answer to Mr. S. W. Page, the Official Receiver, he stated that in 1899 he executed a deed of assignment, the liabilities amounting to £897, and a dividend of 7s. 6d. in the pound was paid. He afterwards purchased some of the stock and recommenced business. He had been sued during the past twelve months, and had had about 20 executions. The examination was adjourned.

Our Office Table.

MESSRS. HART, SON, PEARD, and Co., Ltd., who, like ourselves, were not long since turned out of their old-established quarters by the Strand-Holborn improvement, have settled down in commodious quarters at 138-140, Charing Cross-road, where they still maintain their leading position as art-metal workers and wholesale, export, and manufacturing ironmongers. They have just issued an enlarged edition of section 7 of their illustrated catalogue, treating on builder ironmongery, corrected up to date, which is most usefully arranged, and embraces every possible requisite. As most of their old patrons know, the firm have a reputation second to none for quality and promptness, and are probably equalled by few for the comprehensiveness of their stock, embracing many "out of the way" specialities for which the architect and builder seek in vain elsewhere. Complete rearrangement in the new premises has greatly facilitated selection. In the department of purpose-made goods, having in their own factories a large staff of workmen experienced in the various branches—smiths, brass finishers, locksmiths, &c.—they are enabled to bestow great attention on, and to offer unusual advantages in, the prompt execution of orders intrusted to their care.

At the Langham Hotel on Wednesday, the Hon. Auberon Herbert gave an exhibition of the chipped or figure stones which he regards as the attempts of prehistoric races to picture themselves and their animals, and which were found in the New Forest, where, according to Mr. Herbert, the pits contain enormous masses of worked stones. He discerns in these stones representations of the features of two or three distinct human races. In one class the hair is trained high above the forehead, and in a second, which may either be another race or only a division of the preceding, it is trained straight back over the forehead, sometimes suggesting that a bit of the head has been cut off. A third class is quite different and more negro in type, with a low arrangement of the hair. Mr. Herbert even ventures to draw physiognomical deductions from the marks on the stones, though he admits that there may be a certain element of romance in his speculations concerning the characters of the different races. The first, for example, he thinks must have been strong, self-controlled, thoughtful, and gentle, keen and patient observers of nature, and appreciative of natural beauty. They were exceedingly tender with the stones, and never cut them unnecessarily, but selecting a suitable one for the purpose they had in view, with a few skilful touches they gave it the characteristics they required. In this respect they formed a contrast to the third race, who smashed and broke the stones according to their fancy. Mr. W. M. Newton also showed some specimens of the figure-stones he had collected in Kent and Dorset; these differed from Mr. Herbert's in being a good deal larger; but they, too, presented resemblances to human faces, birds, reptiles, &c., their owner having in some cases assisted the imagination of the observer by filling the hole which prehistoric man is supposed to have intended for an eye with a glass imitation of that organ.

Some examples recently added to the collection of ecclesiastical embroidery at South Kensington are now exhibited there in the Tapestry Court. They were obtained from the Hochon Collection, which was sold in Paris last month. The beautiful Italian orphrey, dating from the second half of the 14th century (No. 831-1903), is remarkable for fineness of workmanship and for the simple manner in which the artist has told the story of the Virgin Mary. The subject is represented in nine scenes, beginning with the rejection of Joachim's offering in the Temple, and ending with the Assumption of the Virgin. The orphrey probably belonged to a cope, and may be compared with that on the cope (No. 580-1884) exhibited in a wall-case in the Italian Court. An English orphrey (No. 827-1903) comes in no degree behind this Italian example in technical qualities, and forms another illustration of the remarkable pre-eminence of English embroideries in the earlier Gothic period. "Opus Anglicanum" had acquired a celebrity on the Continent of Europe before the middle of the 13th century, and beautiful examples dating from that and the following century, and showing unmistakable signs of English origin, are still to be found in

Italy, Spain, France, and elsewhere. The orphrey in question belongs to the close of the 13th century, and may be compared with the famous Syon Cope, and other less-known early English embroideries exhibited among the vestments adjoining the Italian Court. Part of another English orphrey, in two pieces (Nos. 828 and 829-1903), belongs to a slightly later period. Two complete chasubles were also acquired, one of green brocade (No. 830-1903), with French orphreys of the 15th century, embroidered with female saints, and the other of green velvet (No. 825-1903), with a fine Flemish orphrey of the early years of the 16th century, representing a Trec of Jesse. Two bands of Cologne work (Nos. 823 and 824-1903), illustrating the possibility of combining the weaver's and embroiderer's art, date from the latter part of the 15th century. One other piece may be mentioned, an orphrey from a chasuble (No. 826-1903) bearing the date 1526 on a cartouche beneath the central figure of David, and most probably of French workmanship. It forms a simple and useful example of Continental work at a period when the art of the embroiderer in this country, after a decline during the Wars of the Roses, shone again for a brief period before its practical extinction, as far as ecclesiastical work is concerned, at the dissolution of the monasteries.

Last week in Clifford's Inn Hall, Messrs. Farebrother, Ellis, and Co., auctioneers, who recently sold this ancient Inn of Chancery for £100,000, offered for disposal a set of 17th-century woodwork and carving ascribed to Grinling Gibbons, now fitted in a room at No. 9, Clifford's Inn, Fleet-street. This carving is of good design, consisting of a grand chimney-piece, finely carved with foliage and flowers, beautiful panelling with bolection moulding, and a chair rail. The first bid was 100gs., and at 550gs. it was purchased for the Victoria and Albert Museum.

The London County Council has ungraciously and unwisely adopted the recommendations of its Parks and Open Spaces Committee to refuse to hand over to the St. Pancras Borough Council, out of the funds belonging thereto in its hands, the sum necessary to purchase from Lord Dartmouth, the owner, the open spaces in the Highgate-road, which form so picturesque an approach to Parliament Fields. It would certainly be a calamity if these spaces were built upon or otherwise appropriated by the owner, as they very well may be, and the action of the L.C.C. is another curious instance of the perverseness of some Progressives. The borough council of St. Pancras is now about to consider the advisability of purchasing the spaces out of the local rates; but it is unfair that this burden should fall upon it while the London County Council retains far more than enough of the money paid over by the Midland Railway Company which was earmarked for such purposes.

At the last meeting before the recess of the London County Council on Tuesday, the Bridges Committee recommended that the standing orders of the Council limiting the period for considering applications to Parliament be suspended so far as necessary to enable the Council to consider the recommendation that powers be sought in the next session for the rebuilding of Lambeth Bridge. Lord Welby, after pointing out the heavy commitment on capital account, moved that the question be postponed. Alderman Evan Spicer said that the delay in rebuilding this bridge would cause a serious deterioration in the value of the surrounding land acquired in connection with the Westminster improvement. After a long discussion the subject was adjourned, on the ground that complete information had not been given. The Bridges Committee's recommendation, "That the estimate of £1,340,000 submitted by the Finance Committee for the construction of Rotherhithe tunnel be approved," was also postponed. The Piccadilly widening scheme was adopted by 55 votes to 36, the Westminster City Council agreeing to contribute one-fifth of the cost, provided that it does not exceed £40,000.

The annual Conference of the British Medical Association was opened on Tuesday at Swansea. Dr. Griffiths, the newly-elected president, said in his address that the Public Health Acts required improvement to keep pace with the great progress made in medicine and surgery. The appointment of medical officers in rural districts was generally very little better than a farce and a waste of public money. The reform needed was greater central authority and greater power for the county

councils. He advocated making the President of the Local Government Board a Secretary of State. One of the duties of medical officers of health should be to deliver popular lectures on sanitary questions and hygiene generally. The sanitarian motto should be "Educate."

THE Act providing for the work preparatory to the construction of the Charles River Dam, in Boston, Mass., has been passed by the Massachusetts Legislature, and the dredging out of the watercourses in the Fens, with the permanent exclusion from them, and from the Charles River basin, of all sewage, must, under the Act, be begun at once. The actual construction of the dam cannot be carried out, or even ordered, until the War Department at Washington has given its consent: but it is understood that this will not long be withheld, and the Act empowers the Commissioners in charge to complete the work as soon as a permission is obtained. The scheme, as adopted, provides for a high-level dam, which will shut out tide-water, making the Charles and its tributaries freshwater streams. The dam itself to be 100ft. wide, and is to be laid out as park; and the shores of the basin are also to be turned into parks. The present Charlesgate is to be reconstructed, and made artistically creditable to the city; and other changes will naturally follow from the establishment of a permanent high level in all the waters above the dam.

THE following have been appointed to survey the schools in the various union areas of the Essex Education Committee:—Chelmsford and Haverhill, 53 schools, J. B. H. Low, Chelmsford, £120; Stortford, Dunmow, Linton, Saffron Walden, 68 schools, J. Kennedy, Romford, £200; Braintree, Halstead, Rishbridge, and Sudbury, schools, J. W. Start, Colchester, £190; Lendend Tending, 70 schools, T. H. Baker, Colchester, £216 3s. 6d.; Maldon and Rochford, 60 schools, S. J. Adams, Southend, £189; Orsett and Romford, J. W. Dunford, Walthamstow, 14 2s. 3d.; Edmonton, Epping, Ongar, and East Ham, 57 schools, Horace White, Loughton, £30. Total fees, £1,159 5s. 9d.

It is not so very many years since the usual charge for building quantities stood at 2½ per cent. on the cost of the work, based on the accepted tender. Of late competition has brought the fee for quantity surveyors down to 1½ per cent., the now normal charge, and, provided the work is well done, this figure appears to be the most remunerative price, though some corporate bodies offer and only pay 1¼ per cent. For undertakings of large size where the work is very plain this may perhaps suffice; but in moderately-sized jobs thoroughly careful quantities certainly worth 1½ per cent., merely looking at the matter from a business point of view in the interests of the building owners. We see here and there cutting prices, however, occur. At Chelmsford the other day a well-known quantity surveyor in practice in the metropolis undertook the public library quantities at the rate of 1½ per cent. of the lowest tender, the amount of which, according to the resolution of the council, will not be accepted if it materially exceeds £10,000. Mr. H. T. Hare's design in the late competition was agreed to on the understanding that it should be carried out for not more than this amount. As the ground-floor rooms, however, will have to be increased in height by 2ft. to render them suitable for their purpose, the cost probably will proportionately, no doubt, be augmented; but even should the cost reach £14,000, the sum asserted as likely by one member of the council, the above-quoted percentage agreed to for the quantities will interest the majority of our readers, and will do no further comment.

On Saturday last an appeal was heard at the Middlesex County Hall, at Westminster, before Mr. J. L. L. and a fairly full bench of magistrates against the excessive assessments of a residential property at Haverhill. The house till quite lately was assessed at about £70. The owner recently purchased the house, rebuilt the stable, and increased the size of one bay, adding a small porch. The actual contents of the house was not materially increased. She decorated the interior, however, somewhat expensively, and the overseers put up her assessment to £177. She appealed at Brentford and induced the Bench there to reduce the rateable charge to £145 or £147. The Brentford judgment was based seemingly on the basis of what the owner had paid for the property, and the cost of her late so-called improvements, she being the owner in residence. On the appeal above referred to, Mr. Littler said that any consideration

of cost was wrong, as the magistrates had only to do with the rental value, taken not as an outside price, but as a likely amount at which the property could be let. The judgment of the Westminster Court was that the appellant's case would be granted, the gross value being determined at £120, the rateable value to be £102 per annum. This verdict was accompanied, strangely enough, by a recommendation to the overseers that similar properties in the neighbourhood should, in justice to the lady in question, be increased *pro rata*. This rider to a case settled on its merits appears to be quite beyond the province of the Bench, who had no other question of assessment before them at the time. This suggestion to the overseers was made in the absence of the owners of the properties referred to, who thus were unable to defend themselves from wholesale impositions of this character, and thus we can but consider the proposal uncalled for and quite out of order.

A CONTRACT has been signed whereby the Pantreiniog Quarry, Bethesda, will be taken over as a going concern on Aug. 1 by a newly-formed co-operative company registered as the North Wales Quarries, Ltd. The other two quarries proposed to be acquired will be taken over on Sept. 1. Mr. W. J. Parry, the defendant in the late Penrhyn libel action, will join the board of directors on Aug. 8, and be retained as managing director. The continuity of managerial policy will thus be maintained.

At the Court of Common Council last week a memorial was presented by the Vestry of St. Giles's, Cripplegate, inviting the Corporation to render assistance towards the improvement in that locality, by which the fine old church may be open to view from the street, and a site, within an open space, acquired for the erection of a statue to John Milton, who is buried there. The Ecclesiastical Commissioners had purchased for £1,400 a part of the necessary land for this object, and the vestry had agreed to give £1,500 to the Corporation for the remaining portion. The expenses of converting the site into an open space and other incidental matters would cost £3,500, towards which the inhabitants were prepared to contribute handsomely. The church was the burial place of Martin Frobisher, the navigator, John Speed, the historian, and John Foxe, the martyrologist, and Milton; Oliver Cromwell was married there, and it contained some of the finest monuments in the City. The memorial was referred to the Finance Committee for consideration.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0	to £5 15 0
Rolled-Steel Joists, English.....	6 10 0	" 6 12 6
Wrought-Iron Girder Plates.....	7 0 0	" 7 5 0
Bar Iron, good Staffs.....	8 5 0	" 8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0	" 20 0 0
Do., Welsh.....	5 15 0	" 5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0	" 8 15 0
Best Suedhill.....	9 10 0	" 9 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.		
Builders' Hoop Iron, galvanised, £12 to £13 per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£11 15 0	to £12 0 0
Best ditto.....	12 5 0	" 12 10 0
Cast-Iron Columns.....	£6 10 0	to £8 10 0
Cast-Iron Stanchions.....	6 10 0	" 8 10 0
Rolled-Iron Fencing Wire.....	8 0 0	" 8 5 0
Rolled-Steel Fencing Wire.....	6 5 0	" 6 10 0
Galvanised.....	7 15 0	" 8 0 0
Cast-Iron Sash Weights.....	4 12 6	" 4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0	" 9 5 0
Cut Floor Brads.....	9 0 0	" 9 0 0

Wire Nails (Points de Paris)—

6 to 7	8	9	10	11	12	13	14	15	B.W.G.
8/-	8 6	9/-	9 6	9 9	10 6	11 3	12/-	13/-	per cwt.

Cast-Iron Socket Pipes—

3in. diameter.....	£5 15 0	to £8 0 0
4in. to 6in.....	5 12 6	" 5 17 6
7in. to 24in. (all sizes).....	5 7 6	" 5 10 0

[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 0d. per ton extra.]

Pig Iron—

Cold Blast, Lilleshall.....	105s. 0d.	to 112s. 6d.
Hot Blast, ditto.....	65s. 0d.	to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

Gas-Tubes.....	67½ p.c.
Water-Tubes.....	62½ "
Steam-Tubes.....	57½ "
Galvanised Gas-Tubes.....	55 "
Galvanised Water-Tubes.....	50 "
Galvanised Steam-Tubes.....	45 "

	10cwt. casks.	5cwt. casks.
	Per. ton.	Per. ton.
Zinc, English (London mill).....	£24 10 0	to £25 0 0
Do., Vieille Montagne.....	26 5 0	" 28 15 0
Sheet Lead, 8lb. and upwards.....	13 15 0	" 14 0 0
Lead Water Pipe (F.O.R. Lond.).....	14 5 0	" 14 10 0
Lead Barrel Pipe.....	15 2 6	" 15 2 6
Lead Pipe, Tinned inside.....	16 2 6	" 16 2 6
" and outside.....	17 12 6	" 17 12 6
Composition Gas-Pipe.....	16 2 6	" 16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6	" 16 2 6
Pig Lead, in 1cwt. pigs.....	10 16 3	" 10 17 6
Lead Shot, in 28lb. bags.....	15 0 0	" 15 5 0
Copper Sheets, sheathing and rods.....	71 0 0	" 71 0 0
Copper, British Cake and Ingot.....	59 10 0	" 60 0 0
Tin, Straits.....	125 15 0	" 125 5 0
Do., English Ingots.....	125 0 0	" 125 10 0
Spelter, Silesian.....	20 2 6	" 20 10 0

TIMBER.

Teak, Burmah.....	per load £10 5 0	to £18 10 0
" Bangkok.....	" 10 0 0	" 18 10 0
Quebec Pine, yellow.....	" 3 17 6	" 6 0 0
" Oak.....	" 4 17 6	" 7 10 0
" Birch.....	" 5 10 0	" 10 5 0
" Elm.....	" 4 16 0	" 8 15 0
" Ash.....	" 4 15 0	" 8 5 0
Dantsic and Memel Oak.....	" 2 12 6	" 5 5 0
" Fir.....	" 3 2 6	" 5 0 0
Wainscot, Riga p. log.....	" 2 7 6	" 5 5 0
Lath, Dantsic, p.f.....	" 4 0 0	" 6 0 0
" St. Petersburg.....	" 4 0 0	" 6 0 0
Greenheart.....	" 7 15 0	" 8 0 0
Box.....	" 7 0 0	" 15 0 0
Sequoia, U.S.A.....	per cube foot	0 3 6
Mabogany, Cuba, per super foot		0 3 6
lin. thick.....	0 0 6	" 0 0 8
" Honduras.....	0 0 6	" 0 0 7 ½
" Mexican.....	0 0 4	" 0 0 5
" African.....	0 0 3 ½	" 0 0 5 ½
Cedar, Cuba.....	0 0 3	" 0 0 3 ½
" Honduras.....	0 0 3 ½	" 0 0 3 ½
Satinwood.....	0 0 10 0	" 0 1 9
Walnut, Italian.....	0 0 3	" 0 0 7 ½
" American (logs).....	0 3 1	" 0 3 1

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in. :—

Quebec Pine, 1st.....	£22 0 0	to £28 10 0
" 2nd.....	18 10 0	" 23 10 0
" 3rd.....	12 0 0	" 14 0 0
Canada Spruce, 1st.....	12 0 0	" 15 10 0
" 2nd and 3rd.....	9 5 0	" 10 5 0
New Brunswick.....	8 0 0	" 10 0 0
Riga.....	7 10 0	" 8 5 0
St. Petersburg.....	8 5 0	" 16 5 0
Swedish.....	11 5 0	" 19 5 0
Finland.....	8 15 0	" 10 0 0
White Sea.....	11 15 0	" 19 5 0
Battens, all sorts.....	6 10 0	" 14 0 0

Flooring Boards, per square of lin. :—

1st prepared.....	£0 13 6	" £0 19 0
2nd ditto.....	0 12 0	" 0 16 0
Other qualities.....	0 6 3	" 0 14 0

Staves, per standard M :—

U.S. pipe.....	£37 10 0	" £45 0 0
Memel, cr. pipe.....	220 0 0	" 230 0 0
Memel, brack.....	190 0 0	" 200 0 0

STONE.*

Darley Dale, in blocks.....	per foot cube £0 2 3
Red Mansfield ditto.....	" 0 2 4 ½
Hard York ditto.....	" 0 2 10
Ditto ditto 6in. sawn both sides, landings,	
random sizes.....	per foot sup. 0 2 8
Ditto ditto 3in. slabs sawn two sides,	
random sizes.....	" £3 1 3

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations

per foot cube £0 1 0

Delivered on road waggons, Paddington

Depot..... ditto..... Nine Elms Depot.....

Ditto..... ditto..... Nine Elms Depot.....

Portland Stone, in random blocks of 20ft. average :—

Brown..... Whit Bed. Base Bed.

Delivered to railway depot at the

quarry..... per foot cube £0 1 5 ½ " £1 1 7 ½

Delivered on road waggons

at Paddington Depot.....

Ditto..... Nine Elms Depot.....

Ditto Pimlico Wharf.....

OILS.

Linseed.....	per tun £19 17 6	to £20 5 0
Rapeseed, English pale.....	" 23 15 0	" 23 15 0
Do., brown.....	" 22 5 0	" 22 5 0
Cottonseed, refined.....	" 23 0 0	" 24 5 0
Olive, Spanish.....	" 32 0 0	" 32 0 0
Seal, pale.....	" 26 0 0	" 29 0 0
Cocoonut, Cochinchina.....	" 32 0 0	" 32 0 0
Do., Ceylon.....	" 25 0 0	" 25 0 0
Palm, Lagos.....	" 27 0 0	" 27 0 0
Oleum.....	" 17 5 0	" 19 5 0
Lubricating U.S.....	per gal. 0 7 0	" 0 8 0
Petroleum, refined.....	" 0 0 5 ½	" 0 0 6
Tar, Stockholm.....	per barrel 1 8 0	" 1 8 0
Do., Archangel.....	" 0 19 6	" 1 0 0
Turpentine, American.....	per tun 37 0 0	" 37 5 0

A panel in the Royal Exchange, painted by Mr. A. C. Gow, and depicting Nelson leaving England for the last time in his barge from Portsmouth Harbour for the Victory at Spithead, which has been presented by the members of Lloyd's, was on Tuesday unveiled by Mrs. Street, the wife of the chairman of Lloyd's.

LIST OF COMPETITIONS OPEN.

Hunslet—Commercial Gates, &c.	Fred. W. Mee, Clerk, Union Offices, Hunslet, Leeds	Aug. 5
Blackpool—New Offices, Sefton-street	C. Arthur, 34, Victoria-street, Blackpool	31
Howden, Yorks.—Sewerage Improvement	Henry Green, Clerk, R.D.C. Offices, Howden, Yorks	Sept. 12
Stonchaven—Additions to Town Hall	George Murdoch, Borough Surveyor, Stonehaven, N.B.	12
Heywood—Library (£4,500)	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood	14
Bromley, E.—Public Library	Harley Heckford, A.M.I.C.E., Borough Sur., High-street, Poplar, E.	Oct. 2
Rawtenstall—Free Library and Town Hall (Assessor)	A. W. Lawson, A.M.I.C.E., Borough Surveyor, Rawtenstall	12
Vienna—Machinery to Lift Boats	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Clovenhill—Infectious Diseases Hospital	David W. Shaw, District Clerk, 5, Wellington-square, Ayr	—
Acton, W.—School (250 places) (Assessor)	B. S. Gott, Clerk to Governors, Guildhall, Westminster	—
Gillingham—School (300 places)	E. T. Atchison, Sec., 8, Waterloo-place, New Brompton, Kent	—

LIST OF TENDERS OPEN.

BUILDINGS.

Coventry—Sulphate House, &c.	Gas Committee	Fletcher W. Stevenson, Engineer, Gasworks, Coventry	Aug. 1
Thornton Heath—Schools (1220 places), Ingram-road	Croydon School Board	Barrow Rule, Clerk, Katherine-street, Croydon	1
Bradford—Vicarage House for St. Oswald's Parish	(Guardians)	T. H. and F. Healey, Architects, 42, Tyndal-street, Bradford	1
Pontefract—Workhouse Extensions	Tramways Committee	Arthur Hartley, J.P., Architect, County Chambers, Castleford	1
Glasgow—Kiosk at Botanic Gardens	Bryngolen Building Club	John Young, Gen. Mgr., 88, Regent-street, Glasgow	1
Llanberis—Houses and Shops, High-street	Guardians	J. and O. M. Evans, Plastering Lodge, Llanberis	1
Ferndale—Forty-one Houses	Steam Laundry Co., Ltd.	W. A. Lloyd, Secretary, 20, Elm-street, Ferndale	1
Callan—Re-erecting Windmill	G. Bell, J.P.	J. Comerford, Clerk, Board-room, Callan, Ireland	1
Ballycluan—Rebuilding Diamond National School	Gas Co.	R. Sufferin, Manager, Ballycluan, Cromlio, Co. Antrim	1
Abertillery—Steam Laundry	T. J. Masters	G. C. Hillard, Architect, Market Chambers, Abertillery	1
Merthyr Vale—Shop and Premises	Fermanagh County Council	Wm. Dowdeswell, Architect, Trebarris	1
Hillsborough—House	Markets Committee	H. Hobart, Architect, Dromore, Co. Down	1
Fordingbridge—Excavations for Gasholder	Parish Council	The Engineer, Gasworks, Fordingbridge	1
Smithy Bridge—Additions to U.M.F.C. Schools	Standing Joint Committee	W. H. Dinsley, Architect, Chorley, Lancs	1
Cardiff—Rebuilding No. 31, St. Mary-street	Caledonian Railway Co.	Edwin Seward, F.R.I.B.A., Architect, Cardiff	1
Enniskillen—Cells	H. J. Finch	E. Hugh Archdall, Secretary, Court House, Enniskillen	1
Longtown—Cementing Blackbank School House	Mrs. Edwards	Wm. Dixon, Longtown, Cumberland	3
Shrewsbury—Covered Cattle Sale Ring	London County Council	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury	3
Murthly, Perth—Detached Villa at Asylum	Edward McGuinness	David Smart, Architect, Perth	3
East Kilbride—Cemetery Works	C. Edwards's Brewery, Ltd.	J. Cowan, A.M.I.C.E., 179, West George-street, Glasgow	3
Cross Keys, Mon.—Fifteen Houses at Watts-Ville	L. & N.W. and G.W. Jt. Railways	R. J. Strong, United National Collieries, Cross Keys, Mon.	3
Ludgershall—Alterations to Police Residence	Miss Sinkinson	C. S. Adye, County Surveyor, County Offices, Trowbridge	3
Distington—Enlarging Dyon School	North-Eastern Railway Co.	H. Hill, Dyon Side, Distington	3
Glasgow—Passenger Station at Plein Junction	Jambeth Guardians	The Company's Divisional Engineer, 16, Killermont-street, Glasgow	3
King's Lynn—Warehouse, Page Stair-lane	Electricity and Tramways Committee	H. Tilson, Architect, Railway-road, Lynn	4
Cardiff—Playground Extension and Verandah at School	North Eastern Railway Co.	G. Thomas, Architect, Queen's Chambers, Cardiff	4
Gilwern—Additions to Coin Exchange Inn	Guardians	R. J. Francis, Architect, Abergavenny	4
Brickfield Gardens, N.E.—Bandstand, Conveniences, &c.	Urban District Council	The Housing Section, Archt.'s Dept., 18, Pall Mall East, S.W.	4
Cardiff—Alterations to No. 29, The Parade	Trinity Corporation	G. Thomas, Architect, Queen's Chambers, Cardiff	4
Londonderry—Rebuilding Business Premises, Bishop-street	Bersham School Board	J. P. McGrath, Architect, Foyle-street, Londonderry	4
Gilwern—Nine-stall Stable at Navigation Inn	Management Committee	B. J. Francis, Architect, Abergavenny	4
Northwich—Gospel Union Mission-Hall	English Wesleyans	E. T. Ward, Warrington-street, Northwich	4
Shrewsbury—Railway Station	Churchwardens	A. E. Bolter, Sec. to Joint Committee, Paddington Station, W.	4
Bowdens-on-Windermere—Residence	Urban District Council	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	4
Sleights, Yorks—Three Cottages	H.M. Commissioners of Works	William Bell, Architect, York	5
Barrow-in-Furness—Central Hall, Hartington-street	Benwell and Fenham U.D.C.	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	5
Lambeth, S.E.—Repairs, &c., to Workhouse, Renfrew-road	School Managers	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	5
Warrington—Concrete Foundation	Admiralty	The Borough Electrical Engineer, Hensley, Warrington	5
Penshaw—Station Buildings	Standing Joint Committee	William Bell, Architect, Central Station, Newcastle-on-Tyne	5
Limerick—Concrete Floor, &c., at Male Probationary Ward	Guardians	The Engineer, 10, Glentworth-street, Limerick	5
St. Apes—Offices and Additions to Residence	Urban District Council	Sampson Hill, Architect, Green-lane, Redruth	6
Waterloo—Park Shelter and Tool-House, Victoria Park	Trinity Corporation	F. Spencer Yates, A.M.I.C.E., Surveyor, Town Hall, Waterloo	6
Portland Bill, Dorset—Lighthouse Dwellings	Bersham School Board	Corderoy, Selby, and Corderoy, 21, Queen Anne's Gate, S.W.	6
Robostyle—School (100 places)	Management Committee	T. Morris, Architect, 7, Argyle-street, Wrexham	6
Aragh—Alterations to Dormitories	English Wesleyans	R. H. Dorman, County Architect, Asylum, Armagh	6
Yoxby—Chapel	Churchwardens	Arthur O. Evans, Pontypriid	6
Baile, Downpatrick—Vestry and Porch to Church	Urban District Council	The Rectory, Baile, near Downpatrick	6
Seaforth—Park Shelter and Bowl-House, Bowensdale Park	H.M. Commissioners of Works	F. Spencer Yates, A.M.I.C.E., Surveyor, Town Hall, Waterloo	6
Bargate, Grimsby—Residence	Benwell and Fenham U.D.C.	Herbert C. Scapion, Architect, Court Chambers, Grimsby	7
Thornton Heath—Sorting Office	School Managers	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	7
Scotwood—Improvements to Gibson and Co.'s Works	Admiralty	W. P. Pattison, Surveyor, Council Offices, Benwell	7
Ashford—Repairs to School Roofing	Standing Joint Committee	F. G. Beeching, Clerk to Managers, Ashford, Middlesex	7
Embleton—Wesleyan Chapel and School	Guardians	J. Allison, Bassethwaite Lake Station, Embleton	7
Cemaes, Anglesea—Coastguard Station	H.M. Commissioners of Works	The Director of Works, Admiralty, Northumberland-avenue, W.C.	7
Faversham—Police Station, Cottages, &c.	Rural District Council	The County Surveyor, 86, Week-street, Maidstone	7
Brigden—Infirmary at Workhouse	J. Samuel Spry	P. J. Thomas, Architect, Bridgend	7
Crewe—Post Office	Grove Estate Building Club	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	7
Ulverston—Additions to Cottage Hospital	Prescott's Bank, Ltd.	J. W. Grady and Son, Architects, Brodgen-street, Ulverston	8
Londonderry—Cottages	Rev. L. P. Williams	J. J. S. Barnhill, Engineer, 1A, Strand, Londonderry	8
Fermy—Residence	Trustees	W. H. Hill and Son, Architects, 28, South Mall, Cork	8
Gwinear—Farm Buildings	Corporation	Sampson Hill, Architect, Green-lane, Redruth	9
Pontnewydd—Forty Houses	Guardians	Fisher and Sons, Architects, Club Chambers, Pontypool	10
Exeter—New Building at City Bank	Corporation	E. H. Harbottle and Son, Architects, County Chambers, Exeter	10
Sunderland—St. Mary's Vicarage, Tyne Dock	Heckney Union Guardians	Joseph Potts and Sons, Architects, 57, John-street, Sunderland	10
Edwardsville, near Tre-harris—Vestry	Corporation	W. Dowdeswell, Architect, Bryntaff, Treharris, R.S.O.	10
Glasgow—Extension of Workshops	Corporation	Stclair and Ballantyne, Architects, 95, Bath-street, Glasgow	11
Aylesbury—Various Repairs at Union House	Corporation	F. B. Parrott, Clerk, 16, Bourne-street, Aylesbury	11
Bacup—Infants' School, Lane-head-lane	Corporation	Smith and Cross, Architects, Town Hall Chambers, Rochdale	11
Homerton, N.E.—Scully at Sydney-road Workhouse	Corporation	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.	11
Glasgow—Tunnings, Bridgegate and St. Margaret's-place	School Board	The City Engineer, 64, Cochrane-street, Glasgow	11
Eskdale—Farm Buildings, Longrigg Green Estate	John Ainley and Sons, Ltd.	The Clerk of Works, Gatehouse, Eskdale	11
Penrith—Boy's School	Urban District Council	G. A. Birkenhead, M.S.A., Caledonian Chambers, Cardiff	11
Penrith—Stabling, &c., at George Inn	Corporation	J. Berry, Architect, 3, Market-place, Huddersfield	11
Epsom—Stables &c., at Sewage Farm	Trustees	Edward R. Capon, Surveyor, Bromley Hurst, Epsom	11
Northampton—Carpenter's Workshops, &c.	Urban District Council	A. Fidler, A.M.I.C.E., Borough Eng., Guildhall, Northampton	11
Kidwelly, Wales—Alterations to Calvinistic Methodist Chapel	Corporation	Anthony and Sons, Anchor House, Kidwelly	11
Epsom—Depot, Church-street	H.M. Commissioners of Works	Edward R. Capon, Surveyor, Council Offices, Bromley Hurst, Epsom	11
Northampton—Power Station Buildings	L.C.C. Asylums Committee	A. Fidler, A.M.I.C.E., Borough Eng., Guildhall, Northampton	11
Newchurch—Rebuilding Church	Urban District Council	Travers and Ramsden, Architects, 44, Church-st., Leigh, Lancashire	11
Hford—Post Office	Urban District Council	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	11
Llandilofawr—Organ Chamber at Parish Church	Urban District Council	David Jenkins, F.R.I.B.A., Architect, Llandilofawr	11
Epsom—Long Grove Asylum Foundations	King's Norton Union Guardians	The Clerk, Asylums Committee, 6, Waterloo-place, S.W.	11
Colwyn Bay—Isolation Hospital	Merthyr Tydfil School Board	Wm. Jones, A.M.I.C.E., Station-road, Colwyn Bay	11
Selly Oak—Boiler-House at Workhouse	H.M. Commissioners of Works	C. Whitwell and Son, Architects, Temple-row, Birmingham	11
Troedyrhiv—Boys' School (60 places)	Docks Committee	J. Llewellyn Smith, Architect, Aberdare	11
Leicester—Enlargement of Head Post Office	Maldens and Coombe U.D.C.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	11
Bristol—Tobacco Warehouse	University of Wales	W. W. Squire, Engineer, Cumberland-road, Bristol	11
New Malton—Public Offices, Fire Station, &c.	Phoenix Brewery Co., Ltd.	Wm. Hope, Architect, Seymour-road, Hampton Wick	11
Cardiff—Registry Offices	School Board	Ivor James, Registrar, Brecon	11
Gildersome—Wesleyan Sunday Schools		Garside and Pennington, Architects, Pontefract	11
Bury—Offices at Green-lane Brewery		Wm. E. Gill, Architect, Derby Chambers, Fleet-street, Bury, Lancs	11
Dronfield—Warehouse and Offices		Gibbs and Flockton, Architects, 15, St. James-row, Sheffield	11
Wombwell—School		J. Robinson, Architect, Park Cottage, Wombwell	11
Heywood—Alterations at Advertiser Office		Wm. E. Gill, Architect, Fleet-street, Bury, Lancs	11

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IDEAL AND PRACTICAL ART.

IN all branches of professional activity, teaching and practice are often strongly divided. Men who set up as teachers place an ideal, not to say unattainable, standard before them which is seldom followed by their practical brethren. We presume this disparity between teaching and practice, or theory and practice, will always exist, and perhaps it is better that a high standard of art and practice should be aimed at. In the architectural vocation we find this dual mode of existence very prominent. We find men either, from accident or conviction, become teachers or theorists, and remain so all their lives; they never settle down to business in a thoroughgoing way. Others seem to find their vocation directly; they enter at once into the demands of business, placing their art in almost a subsidiary position, and never allowing it to completely control their allegiance. Business, and not art, is the watchword; but with the others—the theorists—it is not that which takes the trade or the public, or which appeals to the practical man, that is considered so much as some ideal property or quality that appeals to some higher sense or standard. In building construction we find very good theories held which will not work. The idea may be excellent and perfectly scientific, but it cannot be easily carried out or applied. Ordinary conditions do not favour it, so the more practical scheme comes to the front. The same distinction is very noticeable in architectural design; idealist and practical schemes are strongly in evidence. The exhibitions of students' designs and work are emphatic evidences of the two classes of minds. Whether we look at the students' work at the Royal Academy, the designs submitted yearly for the Institute prizes and medals, or those which are yearly exhibited at Kensington from students of our Schools of Art, the distinction between the two classes is very obvious. To some extent the work done in all these institutions is academical, and so far it is exempted from practical conditions. The subjects chosen for these competitions are given as exercises of the students' skill in design and composition and drawing rather than as designs for buildings to be carried into execution. Although this consideration ought not to weigh much with the authorities, we know very well that it has an influence over the designers. The design of a building which remains on paper, and is intended to appeal to the minds of examiners, is very different to the design of a building that is to be realised in bricks and mortar, and which will have to go through the ordeal of critical eyes of a committee, members of which are trying to pick holes; of quantity surveyors, who like to improve the drawings and specifications; of engineers and experts, glad to suggest and criticise, or to find easier methods of doing the work; and lastly, the public, who are ever ready to find fault. It must be remembered, therefore, that the academical design can be taken mainly as something that is possible in favourable conditions only; it represents the student's unrestricted imagination, and his power of expressing the ideal. It favours, of course, the architectural skill of the designer, his artistic power to give expression to the idea, and to this content the exhibition of designs of students is valuable, and must always have a place in our architectural system of education. The

youthful pupil is naturally ready and enthusiastic to exhibit his art talent as a designer or as a draughtsman; he spares no trouble and time in looking up examples in studying the best plans, bringing to his task all the natural talent of which he is capable, but impatient of all limitations and practical conditions. A genius in art is generally incapable of submitting to the practical or irksome details of his calling; anything which impedes the flow of his imagination, which restricts his fancy, is distasteful and quite antagonistic to success. But students of this sort have naturally an easy victory compared with those who are beset at every step with conditions and limitations. They can adopt a faultless ideal type of plan to work upon without any trouble as to boundaries of site, "ancient lights," and what not, and they are free to adopt a style in most cases which they are masters of, and which they can use to the best advantage. On the contrary, the student or architect under limitations that cannot be ignored, such as shape of site, ancient lights, contour and levels of ground, local by-law restrictions, and the necessities imposed by the owner, has all these things to fight against and overcome before he can consider his design. Yet it is perfectly true that genius is often invoked by these difficulties; in the overcoming of an obstacle the architect may hit upon a mode or a plan which has all the distinction of a stroke of genius, and which in ordinary circumstances would not have been conjured up. The difficulties of a plan—e.g., the ingenuity necessary in forming a large area at the crossing of a church, or the necessity of keeping a building low not to obstruct an ancient light—have all been instrumental in turning what may have been commonplace buildings into designs of much skill and beauty. In fact, invention has often been the incentive to the production of our greatest buildings. Every architect knows how often a change of plan to suit some urgent want has suggested a feature of value in his design. So it is that the greatest masters of architectural design and planning are indebted to the very problems they have had to solve. Thus the designer of buildings to be actually carried out, though with limited scope, may win the highest achievement, and show himself to be the greater artist than he who has everything easy before him. Which is the greater performance—that which is accomplished without any difficulties, or that which has surmounted them? This is a question which ought to be present in the mind of those who have to examine designs and award merit. The Liverpool Cathedral competition in its first stage supplied us with an example. A few ideal schemes were sent in which could have been carried out on any site; the authors had not studied the obstacles presented by the narrowness of the area, the necessity for a large area at the crossing. The designs subsequently submitted showed a closer study of the problem, and in two or three of the plans the authors have skilfully made a large crossing, or introduced features, as in the selected design, that undoubtedly indicate invention and resource.

There are certain peculiarities to be noticed in the academical or ideal design. The author has generally an ambition which is almost boundless, and his one aim is to gratify. He has always an exaggerated idea of his work. If it is a church it must be cathedral-like in scale and pretension; it must have a central tower, if not two others at the west end, or a domical feature; the plain prose of a parish church is rejected for the epic form. The academical design is nothing if it is not heroic in idea and scale; it must be after the model of a palace or some stately civic building in its details and sculptural embellishment. The author seeks to suggest the monumental or festive character rather

than the utile purpose of the building. In the decorative adjuncts the designer gives himself up to a free and spontaneous imagination. The "play impulse" is strong. Exaggerated scale in the parts, such as large porticoes, flights of steps and halls, palatial staircases, great domes and massive towers, sculpture-crowned pavilions are the elements of his composition. The unit of the human figure in the proportions is lost sight of, for the edifice looks more suited to a race of giants than men of ordinary stature. And the idea of use and occupation is lost also, for we see little attention paid to ordinary details and requirements of practical life. The formal or Classic styles, those in which regularity and symmetrical arrangements are common, are the most favoured by the ideal school, though there are others who go in for the Romantic, who like to revel in Mediæval churches and civic edifices, gate-houses and fortresses, and the picturesque combinations of old-world cities. In all these attempts there is little or nothing of the practical. Material and technic qualities are absent. Stone and brick are treated in much the same manner; often there is no indication of material or texture in the design; surfaces of wall are shown as if they were quite smooth, without light and shade or effects of tone. In the plans the attempt to make an imposing effect is often thrown away. Where the public frequent, the building should testify the fact. The ample entrance and approaches are necessary in those where large receptions are held, as in town halls and hotels; a court is a feature that should not be disregarded. The French are clever in the provision of the "cour d'honneur," as we see in the Louis XV. "hotels," and this court was generally towards the street, as we find in many of the hotels in Paris. Some of these palatial edifices had also well-arranged gardens in the rear, to which the reception-rooms opened. The quadrangle plan is one which admits of imposing effect, but the ordinary designer of prize designs is seldom equal to the task of arranging a plan that will be useful as well as beautiful.

The academical and the imaginative elements are predominant in all ideal designs. Mr. Herbert Spencer, in his "Principles of Psychology," refers to the "play" impulse, or free energy, found in the æsthetic sentiments based on the nervous system. We see it in the primitive kinds of implements in the ornament; in the higher forms of art we see the play impulse dominated by the principle of order, comprising such manifestations as rhythm, measure, proportion, and other modes of arrangement which make up composition. Professor Baldwin Brown notes the festal character of early architecture shown in the Egyptian temple—how little these vast structures were utilitarian in origin, how much was designed, carried out, and adorned in the mood of "play." The plan arranged on an axis of a great rectangle, with the great portal opening into a colonnaded court, thence through pillared halls to a small shrine which contained the symbols of the deity. Avenue, portal, colonnaded court, and pillared hall were designed to lead up to this part of the temple proper, and intended to impress the mind of the beholder. The Greek temple was also a like embodiment of the same mood. The colonnades were made to surround the shrine itself; the root idea was the same—an imposing realisation of the religious festival. The same festal character is apparent—the art of free and spontaneous expression. In a diagram or table of the beginnings of the arts of form, the same author describes the motive power of artistic production as the "free and spontaneous activities, not artistic"—viz., modes of expression under excitement by voice and gesture. These are common to all uncivilised races. Adornment seems to have had a social

origin, while "monument-making" springs out of those habits and feelings which have given to the festival its importance. The utilitarian element in architecture is not found in the other arts of the drama, painting, or sculpture. But we need not trace this table further. All it is intended to show is that art is a free exercise under excitement, but must be controlled. The festal structure made imposing becomes the architectural monument, and round this the decorative arts threw a veil of beautiful imagery. Ideal devices were the objects to be achieved. The principle of order or proportion, if we like to term it, came into notice—an instinct of human nature by which material is moulded into an artistic form. The work of art, whether a building or otherwise, must present itself as a unity, not as a mere formless conglomeration. In architecture of the higher forms, as in the monument, this law of unity is predominant in all the elements which go under the name of "composition." Let us look at the application of these principles. With the student the "free and spontaneous expression" or the "play impulse" is strong, and he naturally resorts to the festal expression—to those precedents of art which represent it. On the other hand, the practical designer subordinates his idea to the utilitarian. The controlling factors of requirements, materials, workmanship exercise a powerful influence on the design. One of the elements of effect in architecture is mass; and the architectural design which is mainly a composition of masses is often imposing. The heroic or grand building has its large and noble portal or entrance, the windows are large, the steps of a great flight are even made to the eye larger by wide treads, columns of great height and size are employed, and even features like balustrades are made to give an impression of magnitude. But in the everyday building the architect has to sacrifice these elements of effect and grandeur. The entrance cannot be made too large, the windows need not be more than sufficient to admit light, the steps must be neither too numerous nor too large for everyday use, the "measure of a man" being the standard to which all the parts should conform. The architect, in short, must adjust his building to its use and the mode of occupation. Now, the ideal design for public offices very often fails in these requirements. The large and ponderous portico and flight of steps are conceived on a heroic scale that dwarfs all the other parts.

The hall and staircase are unnecessarily large and spacious, and contrast with the smaller apartments, and the whole scheme is more suited as a palace of the Legislature than for the municipal requirements. Numberless designs that are submitted yearly in competition show these characteristics. Practical conditions, such as those imposed by site, materials, building regulations, workmanship, are all absent. But the question we have raised touches primarily the early instruction of the student. The failure of much of the architectural education is the precedence given to academical studies, which so generally absorb all his time and attention. If the pupil, after completing his school education, could enter a course of instruction like that recommended by the Architectural Association, much could be done to check the tendency to take up academical studies at the cost of all others. A systematic teaching course—say, two days a week—supplementary to the practical work of the office is the right plan. The Association have at length pursued this course, and the non-academical character of their programme is helpful in retaining a youthful interest in office and everyday practice. The continuation of the "actual" with "theoretical" studies is absolutely necessary to the profession in the earlier days of the career, or a warp of mind is contracted that is very difficult to overcome.

DECORATIVE DESIGNS AT SOUTH KENSINGTON.

MODELLING occupies a high place in design, and too much importance can hardly be given to it. A modelled design exercises faculties of the mind and imagination which a design on a simple plane surface does not; it is really designing in relief, a very important part of the architect's training. The examiners, T. Brock, R.A., G. J. Frampton, R.A., and T. G. Jackson, R.A., of the designs at the Victoria and Albert Museum, regret that there is no improvement in the quality of the work. They recommend greater attention to construction, that more care should be bestowed upon the architectural setting where the design is to form part of an architectural scheme, and they suggest that students should submit small-sized modelled sketches to explain the purpose of the work. Very good suggestions; but they can only be satisfactorily realised when the modeller is again taught to model on the building, when the architect gives more attention and thought to the modelled effect of his work, and studies design in the solid and is not so contented with drawing on paper. There are not many designs in this stage. Ernest G. Webb, Plymouth, has a silver medal for overdoor with four panels having emblematic figure subjects representing Commerce, Science, Art, Technology. The design is certainly clever; there is a grasp of the subject; the square panels are well filled, but the architectural details might certainly be better. John D. Revel, Dundee, has a design for a frieze well modelled; the frieze is coved, and in the coving grouped owls are introduced. The bronze prize is awarded to Charles W. Sharpe, Liverpool, for the base of a column; the figures are well modelled, but scarcely in the true position. A Liverpool student, Violet E. Brunton, is awarded a bronze medal for a sundial of refined outline and details. The figures, in a stooping posture under the cap, are well modelled, and represent Night and Morning on opposite sides of pedestal. Stone or bronze is suggested. The design is worthy of a higher prize. Herbert G. Beal, Plymouth, has a book prize for designs for tiles, but the plants and birds are not well modelled, and the student has failed to catch the right motive of the plant growth. A model for a wall fountain by Maggie Richardson, New Cross, we have seen before. It is decidedly original and clever in the general design and detail of basin with the modelled figures. It takes a bronze medal. A modelled figure from the nude, also awarded a bronze medal, is by Henry Green, West Bromwich. A silver medal is given to Annie McLeish, Liverpool, for a modelled design for a panel showing good arrangement, and to Annie C. Brown, New Cross, for clever model from cast of figures in relief. From the living model, the gold medal is awarded to Fred Halmson, New Cross, for a figure of a girl from the nude, well balanced and graceful in pose, with one hand on the head and the left extended. Two or three other models, one by H. Miller, of New Cross, for the same subject are exhibited. The drawing and painting from the living model are not up to the usual standard—a fact that has been pointed out by the examiners. This is the case with the full-length drawings of figures exhibited. The silver medal is given to Thomas C. Derrick, Bristol, for a well-balanced figure, well studied; and also to Herbert Budd, Hanley, for a careful study of figure. We also notice the drawings of details of the human figure, and a silver medal is awarded to J. Wilson Baxter, Carlisle, for drawings of hands and feet from life excellently drawn. Gilbert Rogers, Liverpool, has a well-studied oil-painting from the nude figure (bronze medal). A drawing of hands and feet in red crayon may also be mentioned. The Time studies are

interesting. We notice the modelling from life of heads; capitals for pilasters with foliage; design for a ceramic mosaic border; a clock-case; for a common seal, &c. Silver medals are awarded to Gilbert Rogers, Liverpool, and Albert W. Dodd, of the same place, for very able drawings in this useful branch of art training, which tests the individual power of the students. A good standard of excellence has been attained.

In the designs for furniture, decoration, stained glass, and metal the general level of the work in the exhibition at South Kensington is creditable, though we do not see many designs of high excellence. There is, as the examiners say, a "striving towards eccentricity for eccentricity's sake." Often this questionable quality is mistaken for originality. One of the best designs for furniture is by a Camberwell student, Hubert Martin, who obtains a silver medal for a lady's writing-cabinet, in which the lines are suggested by the construction instead of being dictated by mere fancy, as in the work based on the L'Art Nouveau style. The cabinet is well adapted for its purpose, and is refined in detail. The design is accompanied by an executed piece of furniture. A jewel-casket in coloured gesso, by Ernest E. Clark, Derby, may also be mentioned, which takes the same medal. The treatment of the gesso ornament and the colour are restrained. Gladys M. Baly, Regent-street (Polytechnic), is the recipient of the same prize for an overmantel with incised and stained wood panels, which has a freshness of treatment, though the wood is rather dark and there is a lack of coherence in the composition. The designs for bellows are clever. One of these takes the silver medal, by Edward Scott, Bradford Technical College, which shows a skilful adaptation of material and good outline. The second design, by John W. Wilkinson, Lancaster, of repoussé copper, is, in our opinion, worthy of the same prize. There is a commonsense constructional treatment, and the outline and detail are clever. We hope to illustrate this and other designs shortly. Geraldine Morris, Birmingham, takes a silver medal for a design for a piano front and an overmantel. The panels for the piano front represent poetical themes, in which the figures introduced are of the Burne-Jones type, but the colouring is rather hard and bright. The frieze by Arthur Paul has a series of winged figures or angels with foliage. The arrangement is bold. George Mason's design for a stencilled hanging is rather dark in the ground, but the design is bold; it receives a silver medal. Jessie Lacon, Birmingham, takes the prize also for a stained wood piano front of decided merit, and the specimens worked exhibit artistic skill. We have spoken of Herbert Budd's pottery panels for a fireplace as exhibiting a true conception of design for decorative panels in woodwork. Charles E. Connor's (Hanley) designs for pottery panels for wardrobe and music cabinet are broadly treated, and display a decorative feeling; the panel of "Music" is admirable. A book prize is given for J. Skinner's design for dado tiles in raised line majolica. A design for a nursery overmantel by Louise R. Jacobs, Hull, we have also mentioned in the silver medal works. Miss Jacobs has certainly given evidence of a true decorative conception in the arrangement of dancing maidens and refinement of colour. Clara Lavington, Leeds, shows some clever designs based on a flowering plant in monochrome, polychrome, and two colours, for which this medal is awarded, and Austin O. Spare, Lambeth, also takes the prize for designs for figure compositions showing invention. Amongst the bronze medal designs we notice several of a decorative character: a painted plaque by Janet Simpson, Hanley; for a pottery corbel by G. Brain, which is clever but poor in the detail; for stencilled decoration by James MacVicar Munro, Heywood; for a piano

front by Lilian Archer, Hornsey; for enamelled Limoges panels; for silver brooches, clasps, pendants; for stencilled friezes; for book illustrations; for a ball-room frieze, composed of figures of youths and maidens dancing, by Winifred Stamp, Regent-street, a design we have seen before; for an altar cross by Maggie Richardson, New Cross, containing the Crucifixion and four enamel subjects in the four corners of arms, a design of some originality; and for a wall-fountain (modelled); for a triptych and holy water-vessel by Josephine Riverstone, New Cross; and for a clock-case by Abbott Newbury Trent, West Ham, of some merit in design. These are all works exhibiting in many cases skilful adaptation of material with artistic skill in detail. Amongst those designs which have received book prizes we find some that are worthy of higher recognition in design or workmanship taken individually. Thus, the designs for bath-room tiles, by Minna Beck, Hanley; the modelled design for embossed wall-filling, by Walter Potts, Glossop; a design for gesso panel, by Ethel Bannister, Hull, indicate thought; and there are some good designs for wall panels by other students. Designs for nursery decoration, by Eugenie Richards, Nottingham, and the ink sketches of figure subjects for nursery books for children are decidedly clever and bright. The designs for colour prints we shall illustrate. Wall tiles are indicative of an improvement. The examiners' "note" observes that a number of the designs for tiles have been rejected because no colours are shown. They also "deprecate the repetition of the same design in identical spaces of the ornament in cases where the design is pictorial and is not connected with the ornament. In proportion as the design becomes more pictorial, the monotony of repetition becomes more apparent." They call attention to a design for wall tiles by John O'Neill Blair, Belfast, for which a bronze medal is awarded, where the figure of the animal is "well treated, becoming a duly subordinated feature of the ornamental design." The design of pottery panels for furniture is an excellent subject, though very few designs are submitted. The best are those of Charles E. E. Connor, already mentioned. A book prize is given to James W. Blackburn, of Huddersfield, for tiles, which represent boldness and quaintness of conception. David H. Hodge, of Plymouth, also has a good design. In this connection we may refer to the studies of historic styles of ornament which are valuable examples for imitation, so far, indeed, as we can recommend the reproduction of old designs. Among the works we notice Gladys M. Baly's studies of old armour, which receive a book prize, the examples of armoured horse, &c., being from the Tower of London. We shall illustrate this soon. The designs for door furniture, finger-plates, escutcheons are not numerous. Joseph B. Petch is awarded a book prize for his work in brass, which is sensible in design and treatment. Violet E. Brunton, Liverpool, receives the prize for a memorial tablet. The design is simple in character and refined in detail; no excess of meaningless ornament being attempted. The design for a processional cross and the details and executed work by Ester E. Tatlow, Wolverhampton, are of merit. The cross is in copper, gilt, silver, and enamel, the ornament of Greek design, and the work exhibits knowledge and taste. Near it Harold Olive Catt, Woolwich, exhibits design for a chalice and paten on silver and enamels, chaste in outline. Charles Hughes, Tottenham, receives a bronze medal for a copper and silver plaque which is designed in a manner suitable for its material and use; and in *repoussé* we note Arthur Penny's (Camden) design for an iron dish, which also is adapted, and is simply and quietly treated in *repoussé*. On the whole the

designs for metal work and jewelry display an advance on previous work. The material has been better adapted to the requirements, and the ornament designed on right principles. But in ironwork we notice very little that is good. The examiners regret the fact in view of the importance of ironwork. We cannot understand why so little attention has been given the electric light standards, which certainly opens a wide field for design. The designs sent are below the average in design, and the designs for gates are of much less merit than we have seen before. In other branches, too, as in pottery, the standard of excellence in design is not so high. The silver medal design for a sgraffito plaque, by Margaret Annie Smith, we briefly noticed last week, is certainly an exception. The lines of the centre figures and the flowing cloudlike emanations are exceedingly refined and subtle in grace and motion, and we may notice also Rosalind Fouracre's (Plymouth) design for a plaque in sgraffito for the taste of the design in the masses and detail. We referred to other silver medal designs last week in this class of work.

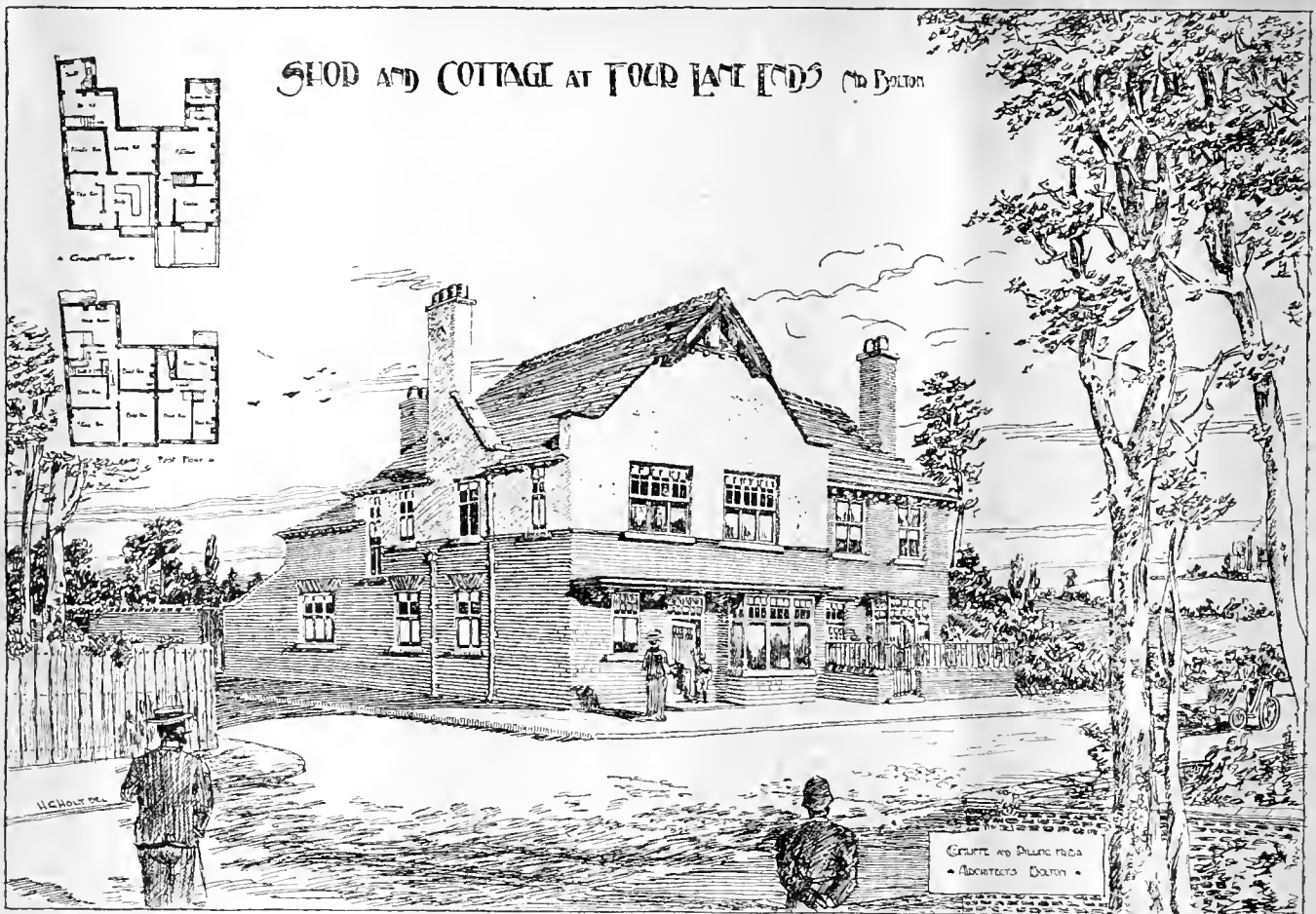
In gold and silver work and enamels, &c., there are a few clever designs which seek to escape from the hackneyed forms of the trade jewellers. New ideas are noticed in the gold medal design by Edith M. Linnell, Birmingham, for a set of designs for clasps, hatpins, &c., which show careful study and adaptation to the material and use. Ethel M. Poppleton, Leicester, receives a silver medal for designs for a chain, pendant, and buttons, which show delicacy and good taste; these are of silver and mother-of-pearl. The silver medal is given to Ernest E. Clark, Derby, for designs for jewel-caskets in gilt wood and matt surface with coloured gesso panels, which exhibit artistic skill and feeling. A bronze medal goes to E. T. W. Ware, Stepney, for design of much refined feeling. Fanny Bunn, Birmingham, takes the silver medal for her designs for panel, "Gloria in Excelsis," and for an enamelled box-lid, both of merit; and the panel in Limoges enamel by Gertrude M. Hart, of the same town, is certainly a pleasing adaptation, and the colour is harmonious. On the whole, a better knowledge of materials and a higher sense of form and line are exhibited in the designs and work.

The book illustrations are not quite equal in number to those of previous years. We note a few of them. Arthur Watts, Regent-street, has two designs of considerable invention in black and white, cleverly drawn, which are awarded a silver medal. The subject of one represents the Red Knight coming back to his mother the sea, bearing dead Elsinore. The other subject is "Riches." A bronze medal is given to Geraldine Morris for a set of small black and white designs for book illustrations of popular subjects, the "Scarf and Scrip," "Will o' the Wisp," &c.—these are cleverly drawn; also Gertrude J. Slade, St. Albans, for illustrations of old buildings; to Richard E. Clarke, Scarborough, for designs for illustration of romantic landscapes, bird's-eye views of a Mediaeval city and of cathedral city, very cleverly executed in black and white. Eugenie Richards takes a book prize for her clever designs for colour prints for children's books in ink. The figures, Dutch and other, are freely and well drawn with a sense of humour. These we shall illustrate. The colour prints are interesting, and more inventiveness in the subjects are shown. Austin O. Spare, of Lambeth, receives a silver medal for a set of clever figure compositions, which display invention and sense of colour. Margaret Lloyd's (Liverpool) bronze medal design, in which historic costumes are treated with a decorative sense of line, shows the value of the stencil in works of this kind. Her stencilled fan-covers are also clever applications of the same process.

The designs for posters show a decided

improvement in this class of art, so often associated with mistaken ideas. At one time these designs were more or less pictorial, in which the artist sought to produce pictures or figure compositions; now designs are dictated by a more logical sense. A bronze medal is given to Gertrude Comber, of Regent-street Polytechnic, for a design exhibiting a sensible treatment of subject and colour. Book prizes are awarded to Arthur Mackinder, Lincoln, for a treatment that will commend itself to the true artistic mind, and to Frank Quirk, Fenton, for a clever drawing of "Cinderella." The designs for book covers also show an improved sense of ornament, both in modelled leather and *repoussé*. An embossed leather Prayer-book case, by Kate M. Eadie, Birmingham, conceived in a true spirit, takes a silver medal; but it is impossible to notice other creditable work of modelled leather. Stencil hangings show an advance. In correct principles a greater variety is shown, and the designs are more useful, and within the limits of the process. The blending of colour to imitate painting is not so much seen. These are distinct gains. The silver medal has been awarded to David H. Hodge, Plymouth, for a frieze and wall filling for an able treatment, though the colour shown in the sketch is preferable to that used. The same prize is given to George Mason, of Bradford, for a clearly expressive design and colour scheme; also to Constance Salisbury, Newcastle-on-Tyne, for a simply arranged design for wall-hanging, treated in a correct manner. A bronze medal is given to Harry A. Wright, Bradford, for a stencilled hanging, well arranged and effective, and a book prize to Winifred E. Burnup, Newcastle-on-Tyne, for a clever stencilled design; but the colour treatment is not as satisfactory as it might be. The wallpapers are not up to the standard of previous years, and not one receives the bronze medal—a rather remarkable fact. We cannot refer here to the textile designs, painted muslins, hangings, &c., which occupy a gallery. There are very few designs for linoleum, and only one receives a bronze medal (Naomi C. Gray, Battersea) for a proper treatment of material. A bronze medal goes to Lily Day, of Norwich, for her design, "Venus Victrix," an embroidered panel for overmantel, cleverly executed. Mabel B. Keighley, Plymouth, takes a bronze medal for a panel in needlework and appliqué, showing a right association of the two methods. The embroideries and laces are numerous, and the designs are up to the standard. We can only mention a design for an embroidered chasuble, by Lizzie Perry, Cork, which is well designed for its purpose, and is truly symbolic. The cross perhaps is rather large and out of scale with the vestment, but the treatment is suitable. The designs for embroidery are creditable, though not of high merit, and a panelled figure design for a linen cloth for Communion table is tastefully treated and executed by Minnie Bolton, of Birmingham. We have no space left to refer to the modelling and drawings from the Antique, painting from still life, water-colours, &c., though there is a better appreciation shown of methods, colour, light, and shade. Arthur Mackinder, Lincoln, has a clever group in oils of a clock with weight. The stained-glass window and reflected light on wall are painted with much feeling. We hope to illustrate this. It takes a bronze medal. We may add there is much confusion in the arrangement of the works, which entails immense trouble on visitors. Each subject and the prizes should be grouped together, and in this way much fruitless toil and search would be avoided.

The Lambeth Borough Council has purchased a site for £1,100 at Brockwell Park for the purpose of erecting upon it a public library.



SHOP AND COTTAGE NEAR BOLTON.

WE give herewith a perspective drawing of a small building near Bolton, consisting of shop and house, with cottage adjoining, all being built of local patent bricks; upper part of shop roughcast. The architects were Messrs. Cunliffe and Pilling, F.R.I.B.A., of Bolton.

A TALL CONCRETE OFFICE BUILDING.

THE Ingalls building in Cincinnati, erected at a corner of two business streets, is fifteen stories high, and is entirely constructed of reinforced concrete. It is 50ft. by 100ft. The structure resembles those of other steel concrete buildings; but this is the first tall office structure built on this system, and new methods had to be used. It differs much from the ordinary steel-cage skyscraper, where the operations conform to recognised standards, and is of two distinct classes: steel construction and floor and wall building, which are successively executed. In the concrete building the construction has to be carried up solidly and continuously. After the site was cleared, and the adjacent buildings shored and underpinned, the foundations were laid, the footings were built, and the column and wall moulds were set on them. The *Engineering Record* says: Most of the columns in the stress fronts have concentric independent footings, about 11ft. square and 2ft. deep. For the columns in the party-wall there is not room to make separate concentric footings of sufficient area without extending under the adjacent buildings; these columns are, therefore, arranged in pairs with those of the nearest interior longitudinal row, and each pair is supported on a single length footing perpendicular to the party-wall, and symmetrical with the centre of gravity of the two columns. There are six of these footings, which consist essentially of a continuous pyramidal platform having integral with it an upper longitudinal rib, which, like the extended base, is reinforced with twisted steel rods calculated to take the tensile stress. This construction resembles the system of grillages, distributing girders and columns to balance wall columns in steel cage construction, and has the merit of making the whole substructure a single solid mass instead of separate members. The wall connecting

these exterior columns is cast with them, and is only 4in. thick next the adjacent building. Around the windows the walls are 8in. thick to provide suitable reveals; the street walls are 6in. The *Record* give illustrations of the building during erection, and the details of foundations and the concrete mixing plant and moulds. Messrs. Elza and Anderson were the architects who designed and supervised the work. Four large bins were built on the cellar floor, and were filled with cement, sand, and stones, delivered by waggons, and dumped through holes in the side-walk. The cement bin was provided with a special inclined chute to allow the cement bags to slide down to the lower level, and these bins contained material enough for two stories of building. Special barrows were used for sand and stone to insure the proper proportion of each, and these materials and the required bags of cement were dumped from the wheelbarrows directly on to the revolving drum of concrete mixer, and then were discharged into the hauling bucket. This is described. The mixer, bucket, and wheelbarrows are made by the Ramsome Concrete Machinery Co. The average progress is about three stories per month of finished structure. The columns are made in moulds, having vertical boards nailed to outside horizontal battens to form the sides of square pillars. They are held in place by horizontal wood yokes on opposite sides, connected by bolts through the projecting ends. The moulds for floor beams and girders are carried on pairs of wooden joists on the column moulds, supported where necessary by extra joists and verticals. These moulds are of vertical and horizontal planks nailed or clamped together, and on their upper edges to horizontal 2in. planks which support the floor slab. No falsework or scaffolding is required. The column moulds are dumped from the floor above to the bottom of moulds, the steel rods being placed before concreting is commenced, and wired in position. We may add the Ferro-Concrete Construction Company are doing this work. The steel reinforcement of floor is shown. The horizontal, transverse, and longitudinal floor bars are in double tiers, supported on occasional cross rods to hold them up above the moulds before the concrete is placed. This is dumped from wheelbarrows, spread to required thickness, rammed, and the surface dressed smooth to straightedge

and gauge. The moulds for the wall columns are made with three sides only, the side next wall being omitted so as to make the concrete unite with the face of wall. The wall moulds, which are pierced by openings, are built of horizontal boards fastened together with vertical battens nailed on the outside about 3ft. apart. Three sets of moulds are used, so that the lower one is constantly removed and re-erected while the upper one remains in service. The walls are faced with marble and brick veneer. The work is still in progress. The concrete girders are supported as long as possible after the moulds are removed, so as to afford the concrete time to attain its maximum strength before being loaded. They are wedged up to temporary vertical shores under their centres. This building will be a good example of the possibilities of concrete reinforced with steel. We are indebted to the *Engineering Record* for these particulars, and refer our readers to that journal for a more detailed description of the work and apparatus employed. When completed, this Cincinnati office building will afford an example of the method of construction. Is it too much to expect that in London a similar use of reinforced concrete construction may be made for certain structures? The engineering designs and details of construction were made by Mr. Henry N. Hooper, chief engineer to the contractors, the Ferro-Concrete Construction Co.

TESTING A FLOOR.

AN instructive and interesting experiment took place before a company of architects, engineers, and other scientific experts last week at the extensive stores of Messrs. Whitbread and Co., of High-road, Tottenham, the object of which was to test a floor 25ft. 9in. span constructed on Hennebique's patent system of ferro-concrete by Messrs. W. Cubitt and Co., of Gray's Inn-road. Mr. Arthur Dixon is the architect of the new buildings. The Hennebique system of ferro-concrete construction has this decided advantage over many other systems, it employs each material to the most economic advantage to perform its own function, not, as in many others, using iron and concrete wastefully, and without regard to their distinctive functions. Thus the beam on this system is treated in the



THE VILLAGE CLUB AT HOLMWOOD SURREY

HERON & BELLAIRES, JOINT
JOHN H. BEART F.O.S. ARCHITECTS

most scientific manner. The portion above the neutral axis engaged to resist compression is of concrete, while the lower part is composed of steel rods embedded in the concrete, which take all the tensile stress, the shearing stresses being dealt with by steel stirrups hooked at top of beam, which support the rods at intervals, and are placed nearer together at the points of support. In fact, the ferro-concrete beam in its construction resembles the old-fashioned trussed timber beams, in which an inverted iron bar truss was introduced in the thickness between two pieces of timber. In the Hennebique system the lower steel rods pass horizontally through just above the soffit of beam, while the rods above form an inverted truss in tension where the greatest bending moment exists, the ends being carried up to the top of beam or over the support if it is a continuous beam. The strains on the beam are thus utilised to the greatest extent; concrete is superseded when it has little to do. We may compare the Hennebique system of floor with the I rolled iron or steel beam, but instead of the narrow upper flange of the latter, the compression is taken by half the concrete floor slab on each side of the concrete beam, and the tensile stress by the steel rods in the bottom part of beam: thus a far more efficient floor is provided, though the concrete beams look a little heavy below. On the occasion of our visit last Thursday week, the floor, over a long basement store, was being loaded in the centre with bags of ballast. The floor, of which the plans and section were on view, is one of considerable length, eleven bays of 11ft. 2in. centres, and, as we have said, 25ft. 9in. clear of the walls. The main cross-beams are, including the concrete floor thickness, 27in. in depth, or 22in. from ceiling to soffit of beam, and its width is 19in. There are eight steel rods at the bottom, each of these being 1½in. diameter. The effective depth of floor is about 21in. These main beams rest on concrete templates or plates on the thick brick walls. Longitudinally, the floor is divided by four smaller beams, which rest on the larger; each of these is 9in. by 5in., or 14in. deep if we include the thickness of floor. In these beams two steel rods are imbedded at the bottom. The concrete flooring is 5in. deep, and on the top are imbedded a number of steel bars transversely. One large beam at the end of store has a weight of 100 tons, and six steel rods top and bottom. As the loading proceeded, the instruments for recording the deflection in the centre beam were carefully read,

and the results noted in the diagram on a table. Three instruments—one in the centre and one at each end, near to the wall-bearings—were used. We were informed by the architect that a live load of 4cwt. per square foot was required, but that the floor was to be tested up to 6cwt. per foot, or 50 per cent. in addition. The cement and shingle were mixed in the proportion of 4 to 1. Martineau's cement was used. The observations and readings of the instruments showed a steady curve made by the increments of the load. When 57 tons were placed on the floor there was barely a deflection on centre of ¼in. When 70 tons were put on there was about ½in. or nearly. At nearly 3 o'clock the load on the floor had reached 86 tons, or equal to 6cwt. per square foot of flooring, and the deflection was as nearly as could be read ¾in. (4.8mm.), very small, proving that the concrete beam with its steel rod reinforcement had been brought into action. The load on the floor was afterwards increased by 50 per cent. After the instruments were read, the load was removed and the reading was again taken. The result of the test is highly satisfactory, as proving the value of this combination of steel and concrete for floor construction. The deflection under the load is too small to be taken into account, and the floor and beams resume their normal condition when the load is removed. We notice a slight but appreciable camber has been given to the beams. The test is another proof of the applicability of this system to the construction of floors carrying heavy loads. Some time ago we illustrated examples of the system applied to supports and floors, and pointed out the fire-resisting properties of the invention. The metal is reduced to a minimum and is well covered with concrete. Under the most intense heat the rods are kept in position. They are secured to the body of the concrete by the stirrups, which keep them from twisting or buckling, a source of danger with the ordinary iron or steel beam, even if protected underneath. Mr. L. G. Mouchel represents the Hennebique system in this country.

THE VILLAGE CLUB, HOLMWOOD.

THE club and caretaker's residence were erected at a cost of £1,440, from designs by Messrs. Heron and Bellairs and John H. Beart Foss. Local materials were employed, portions of the exterior being rendered in roughcast. The

clubroom is spanned by an open-timber roof, the floor being of wood blocks. The work was admirably executed by Messrs. Colls and Sons, Dorking.

ON BUILDING TIMBERS.—XXXIII.

HARDWOODS.—(Continued).

IN the enlargement of a free library just opened in the North-West of London the walls are lined for about 4ft. up from the floor with a dado of pitchpine, and the treatment of the wood in this work is so unfortunate that a notice of it may, with advantage, be given here, as the lesson to be drawn from this failure, if applied to the woods described in this section, will show the use and abuse of fancy woods in ornamental work. All wood used in joinery is covered with paint, or polished, this latter including varnishing. In one case the grain of the wood is completely hidden, and in the other it is exposed and emphasised by covering it with gums of one kind or another dissolved in spirit or oil. Where the wood is to be painted, it is clearly a matter of no importance how the grains run, except from a structural point of view, and this is not now under consideration; but when the grain is exposed it becomes a matter of the first importance that the wood be cut and selected so as to be suitable for that special part of the framing in which it is to be used. All joinery consists of framing and panelling with added mouldings, and where the grain is to be exposed it is universally agreed that the panel must be the most ornamental, and consequently the most highly figured wood; this being so, as a contrast to the panel, the framing must be straight framed and have as little figure as possible, so that at a distance the eye may at once distinguish one constructive part of the framing from the other part. In other words, the stiles and rails must be selected so that they shall stand out clearly and distinctly from the panels, and be in no way confused with them. Patchiness of effect may also be produced by using wood of different shades: sapwood, dried before it "blues," is, in pitchpine, lighter than heartwood, so that difference of shades of colour may produce as important an effect as differences in grain or figure. Now, in the particular framing referred to there are mistakes of colour and mistakes of grain, and these are striking as the work is new and highly varnished. In several panels there is a joint generally to one side or the

other of a centre line. On one side of this joint the wood is highly figured, on the other side it is comparatively plain. This throws up the joint, marking it unmistakably, and disturbing the face of the panel by breaking it into pieces which abruptly abut against each other. In other panels the figure is the same all over the panel; but one-fourth the panel is light sapwood, and the other three-fourths dark heartwood. Of course, the result is equally unfortunate, for the object should be to endeavour to hide the joint instead of making it plain to everyone. In the framing, again, some of the stiles and rails are cut with a radial face and others with a tangential face, giving totally different "figure": the wood, too, is mixed light and dark sapwood, "kiln dried" perhaps, and heartwood. The effect of the whole is decidedly patchy and bad, and to one who knows that a very little time and thought would have prevented this, it is as intolerable as the neglect to guard against it is inexcusable. In joinery which is to be varnished, all the different pieces which go to make it up should be carefully selected for the positions which they are to occupy. Let all the stiles and rails be straight-grained, and all the panels be figured, and the same coloured wood be used throughout for the former, and, if necessary, another coloured wood for all the latter; but avoid mixing grain, figure, and colour indiscriminately all over the work. If the stiles are 4 in. or 4½ in. wide and 1½ in. thick, let the 4½ in. face be from a radial cut; if the rails are of the same width, or over, let them, too, be from radial cuts. The panels to be figured must be cut tangentially, and let them all be so cut, and of wood of the same quantity of figure, and of the same colour. On examining the boards in a naked floor a few will be seen with the grain running in parallel lines from one end of the board to the other. These parallel lines represent a section of the tree from which the board was cut, along a line radiating from the centre to the circumference. The other boards show irregular conical-shaped lines which follow each other and die out a few inches apart all along the board. These lines represent tangential sections of the annual rings, and a mere inspection of the board will tell at once whether the face is cut radially or tangentially. Again, if the face of a tangentially cut board is round, having originally been planed flat, that face is the heart of the wood; if, on the contrary, the face of the board is hollow, the heart face is on the joist, and that near the bark is turned up. In selecting wood for framing, an inspection of the end of the piece will always tell how it has been cut and the best way to utilise it. As a matter of fact, for all good work, after the "deals" are selected, the scantlings required should be marked on the end before they are handed to the sawyer. To turn a number of deals over to a sawyer to run them anyhow through a deal-frame or circular-saw is only to butcher the stuff and ruin the work. All highly-ornamental hardwood is obtained from burs, warts, excrescences, or other abnormal growths on trees. It has no strength and little cohesion, and must, therefore, to stand in joinery, be cut into veneer, and attached to some straight-grained wood which will support it. In many hardwoods, a slight change of colour in the face of a piece of veneer makes some more or less distinct shape. In this case it is usual to join in a wide panel each face of the same cut, so as to make a symmetrical marking in the panel. Even in door panels only 9 in. wide some beautiful effects may be obtained by veneering each panel face in four pieces, the end pieces being mitred into two others, joined down the centre, the peculiar marking or shaping of the grain being carefully matched in all four pieces. There is no handsomer wood for oak door panels than dark pollard oak, especially that obtained from trees in which the heart has been decayed for some time. A tree cut for this purpose by the writer was over 7 ft. in diameter, with a hollow in the heart of over 5 ft. in some places; in fact, it was a shell of wood about 12 in. thick. To cut this down with a "cross-cut" saw it was necessary to lap and rivet two saw-blades together in the centre of the tree. This was easily done, as there was an opening in the side large enough to admit the workmen. The wood proved to be of such a splendid rich colour and handsome figure that at a distance it was almost impossible to realise it was wood when the face was carefully matched in panelling (as suggested above) and varnished. It is quite possible that work done as suggested may be considered more "cabinet" than joiner's work,

but it must not be forgotten that all good joinery is, or should be, quite as well finished as cabinet work, and one really merges into the other. A good bench hand should be able to do good work in furniture making, and some of the best oak doors can be made by cabinet-makers if their joints are carefully looked after; the bench hand is best at joints in building joinery—that is, in arranging the structural part of them—but for close jointing and finish the cabinet-maker will surpass him; the best work would be produced by joiners and cabinet-makers working in harmony to secure that end. To make this plainer, if a cabinet-maker makes, say, an outside door in oak and it shrinks, daylight can be seen through the mitres if the mouldings are in the solid, for he has not arranged his joints to allow for shrinkage. A joiner's door, no matter how much it shrinks, in reason, will have been so constructed that light cannot be seen through it, and this is so, for the evolution of the bench joiner has been on different lines to that of the cabinet-maker. To some architects veneered wood is an abomination. This view is held by men who know nothing about wood, or only as much as the old lady who, in wishing to dispose of her piano, assures the would-be purchaser that the case is all "solid walnut." Neither see that, owing to the peculiar structure of the wood, if it were solid it would be perfectly worthless for anything but the fire, and not much good for that. "Gothic" men are dead against all shams—at least they say so—and veneered wood is one of these; but, after all, there is less false construction in covering one wood with another which needs support, than in buttressing walls which need no support, or in putting string-courses and label mouldings where there is no rain to be thrown off the walls, and where they are a useless and expensive nuisance. The Goth hates all shams except his own; the same may be said of the Classic man, with his columns which carry nothing until he puts sham entablatures and cornices on them; in fact, to parody "Hindibras," both—

Compound for shams they are inclin'd to,
By damping those they have no mind to.

The æsthetic value of any particular feature in a building may be due either to accident in its design or to its execution. Leaving the former (as it is popularly understood) out of the question, for an architect is always an artist in his own estimation, it is obvious that work which shows on the face of it careful handling and thoughtful arrangement of parts will afford more pleasure to a spectator than that which is clumsy and slipshod. Veneered work will therefore be valued in proportion to the skill with which it is put together, and to make its use a success the workman must use his brains as well as his hands.

IRONWOOD, *Xylia dolabriformis*, is a large deciduous tree found in Southern India (ranging northward to Bombay and Orissa), Arracan, and Burma; it is from 90 ft. to 100 ft. high and from 3 ft. to 4 ft. in diameter. Next to teak it is the most important tree in Burma, where it is found in all deciduous forests of the Irrawaddy Valley up to 24° latitude. Ironwood is hard, coarse-grained, and beautifully mottled, showing wavy fibres on radial sections. The colour is a dark brown inclining to red, and it is very heavy, a cubic foot weighing 60 lb. There is a good deal of resin in Indian ironwood, but there is much more in the Burmese wood, which makes it the more durable wood of the two. Both are used for piles and framing in viaducts; much of this wood is also used for railway sleepers. Honduras ironwood is a tree known to botanists as *Laplacea hematoxylon*. New South Wales ironwood, *Syncearpia leptocarpa*, is a tree about 50 ft. high, the wood being much used for rough engineering work. An ironwood commonly used for tool-handles in Tasmania is furnished by a small tree known as *Notelaea ligustrina*. At the Cape there is a black ironwood, *Olea laurifolia*, which is used for the framing of waggon beds; it is as durable as *Lignum vitae*. A white ironwood found in Natal, *Toddalia lanceolata*, is a hard, tough wood used like the black ironwood for waggon frames. Some stray logs of ironwood find their way into the market here, but they are not purchased for building work. IRONBARK, *Eucalyptus paniculata*, is an Australian tree which grows to about 100 ft. high, and from 3 ft. to 3½ ft. or more in diameter. The wood is hard, strong, and tough, but without much figure. It comes here in squared logs, which are sold by the cubic foot, caliper measure, at about 18d. There are usually from 70 to 80 c. ft. in a log. KARRI, *Eucalyptus diversicolor*, is the largest and

most valuable tree found in the Australian forests; an average specimen may be put down as about 200 ft. high and 4 ft. diameter, with no branches within from 130 ft. to 150 ft. of the ground. Trees up to 300 ft. high are not unusual; they have a diameter of nearly 10 ft., and contain over 100 tons of timber! This wood is hard, heavy, elastic, and tough; the grain shows that the fibres are interlaced, which makes it a wood hard to work, and, therefore, more suitable for use in engineering than in joinery. Karri may be seen laid in the wood-block paving of many streets in London, Dublin, and other cities: it is easily recognisable by its deep red colour. The blocks are usually 9 in. by 3 in. on the face. For heavy traffic the depth is 5 in.; in other cases 4 in. is found to be ample. In Paddington the life of a "Baltic deal" block is from five to nine years, according to the traffic: Karri is found to last three or four times as long in this latter respect. JARRAH, *Eucalyptus marginata*, though it is shorter and more brittle in the grain than Karri, ranks with it in value for wood-paving. Jarrah has been used for furniture and joinery; its hardness, durability, and colour recommend it for both purposes; but the labour in working it will prevent this wood from being extensively used in building. With that perversity which characterises dealers in wood, they have given the name of "pine" to the timber. It has been pointed out before that they persist in calling real pine "fir" and "deal": Sequoia, Jarrah, and Mid-European pine are all "redwood"! Prime "Kauri pine" planks are put on the London market from 1½ in. to 5 in. thick. Common widths for the 1½ in. are 22 in., these, 4 and 5 in. thick, can be had up to 16 in. wide, the lengths being from 6 to 33 ft. Jarrah, "dry," in scantlings, can be obtained from 3 in. by ½ in. up, and from 5 to 26 ft. long. An ordinary marketable stuff 1 in. board is worth about 3d. per foot. LIGNUM VITÆ, *Garcinia officinalis*, is an evergreen tree found growing in Jamaica, Hayti, Cuba, Colombia, and Venezuela, where it seldom attains a greater height than from 20 ft. to 30 ft. The wood is very hard, and so heavy that it sinks in water, a cubic foot weighing 83½ lb. (water weighs only 62½ lb.). The lignum vitae of British Guiana is the wood of *Lorota trifolium*, a tree which grows from 30 ft. to 60 ft. high, and from 16 in. to 18 in. in diameter. New South Wales lignum vitae is *Arceuthobium falcata*, a shrub, in fact, which attains a height of from 15 ft. to 20 ft., and a diameter of from 8 in. to 14 in. Another lignum vitae, *Callistris quadrivalis*, is common in Oranian and Algerian Tell, and in Tunisia; the heartwood of this tree is brownish red, and the sapwood white. There is also lignum vitae in the Lower Guinea and Mozambique districts; it is the wood of a large tree known as *Combretum truncatum*. This is also compact and hard, the heartwood being a deep reddish brown, with white sapwood. Lignum vitae comes into the London market from Jamaica and Maracaibo. It is sold by the ton in pieces weighing a little under 100 lb. each. LOECST WOOD, *Hymenocleis courbaril*, is an abundant tree in British Guiana, where it grows from 60 to 80 ft. high, with a diameter of 8 ft. or 9 ft. The wood is hard and close grained, the colour being reddish brown streaked. It does not split or warp, and takes a good polish. Loecst wood is also found in Trinidad. Some logs from Demerara were recently offered for sale in London; the smallest log contained about 41 c. ft., and the largest 95 ft., caliper measure. A locust wood, *Robinia pseudacacia*, grows east of the Rocky Mountains in the United States; this tree attains a height of from 70 ft. to 80 ft., with a diameter of from 3 ft. to 4 ft. The wood is largely used for trenails. MAHOGANY, *Swietenia mahagoni*, is a large tree, which yields the most valuable furniture-wood. In building it is commonly used for handrails, w.c. seats, and bath-tops; in good work it is used for sashes, doors, and partitions in banks and other commercial buildings. The architect uses it in his T-squares, the open grain of the wood rendering it necessary that the ruling edge of the blade be covered with a strip of ebony. A few months ago three logs of mahogany from Axim sold for £3,230; they were cut from one tree, and contained 6,852 superficial feet. The largest log was 25½ ft. long and 46 in. deep at the butt. African mahogany, *Khaya Senegalensis*, is shipped from Axim, Assinee, Benin, Boutry, Cape Coast, Grand Bassam, Grand Lahou, Lagos, Sassandra, Sapeli, Sekondi, Twin Rivers, Coco Beach, and Cape Lopez ports along the Gold and Ivory Coasts. "Cuba" mahogany is shipped from Jucaro, Tunas de Zaza, Trinidad, Santa Cruz,

and Manzanillo; "Tabasco" from Laguna Determinos; "Honduras" from Belize, Truxillo, and Puerto Barrios (Guatemala); "St. Domingo" from Porto Plata. Mahogany also comes from Panama (New Granada), Mexico, New South Wales, Moulmein, Caobang in Tonquin, and Cispata in Colombia. Of all these various kinds of mahogany St. Domingo wood stands unrivalled for texture and brilliancy: it works well and always looks well. Mahogany should be thoroughly dry before it is used in any joiner's work. "Bone dry" is the usual expression to describe its condition; but no one knows what "bone dry" means. It is a popular phrase taken to mean much, when in reality it means nothing definite. The commonly accepted criterion of seasoning in mahogany is the condition of an inch board under cover on sticks for one year; but this method of determining the value of "seasoned" mahogany is absurd, for a 6in. plank will not be in the same condition after six years as an inch plank after one year's exposure. All wood on sticks under an open shed will contain more moisture than if stacked in a closed shed; and this latter will not be so dry as wood in an atmosphere artificially warmed. It is therefore time for timber merchants who invoice "dry" mahogany and other woods to adopt for their own protection some scientific standard of dryness or seasoning, to which they may refer for an authoritative settlement of any dispute arising out of their trade transactions. It is amazing to think that Englishmen, who pride themselves on being possessed with such an unusual amount of common sense, fail to see the absurdity of asking a lawyer sitting in one of their courts to decide what dry wood is. Three highly-paid public servants will sit in an "appeal" court all day racking what passes for their brains, trying to solve the conundrum, "When is a painter's ladder not a ladder, but a scaffold?" Others can't tell when chalk ceases to be chalk and becomes lias: while a third contingent is puzzled to know if ground Kentish rag is Portland cement or not! Surely the sense of humour must be dead in a country where men take the decisions of such courts seriously! The value of mahogany will depend on the size, condition, and figure of the log; but for ordinary sorts the following are fair average prices: Honduras 4½d., Cuban 8½d., African 7½d., Tonquin 5½d., Tabasco 7½d. Prices range from 3½d. to 3s. 6d.; special logs go up to 8s. and 9s. Mahogany is always sold by the superficial foot, the sale contents being much under the extreme contents.

MAPLE, *Acer saccharinum*, syn. *barbatum*: Sugar tree, sugar maple, hard maple, rock maple is a tree which grows to over 100ft. high and 4ft. in diameter. It is found in Canada as far west as the shores of Lake Superior, in the north-east United States, west to Mississippi, and along the mountains to North Carolina, growing best in the Adirondacks. The wood is very hard, close grained, strong, and heavy, weighing about 43½lb. to the cube foot. Its colour is light brown of various tints, the sapwood when dried being yellow. It is used for interior joinery, flooring boards, and furniture. A maple floor may be seen in Messrs. Stanford's, the publishers, Long Acre. The tree is called the "sugar maple," for the sap yields sugar on being evaporated, and it is said that bleeding the tree does not injure the wood. About 3gal. of sap will make 1lb. of sugar. The season's yield of one tree will be from 2lb. to 30lb. The abnormal growths or freaks, known as Bird's-eye, Blister, Pin, and Curling, occur more in maples than any other trees. "Blister maple," when polished, shows a surface covered with markings like blisters: this is sometimes called "landscape maple," and it is the rarest of all figures in this wood. The best figure is found near the bark, and the poorest towards the heart of the tree. Blister maple is only a larger and more exaggerated form of the marking so well known, chiefly from grainers' imitations of it, as "bird's-eye." A radial section of the wood shows straight grain barred across horizontally with medullary rays, which are brown streaks and dots across a silvery background. The ornamental wood is used as veneer, which is turned off tangentially from the bark to the heart in a lathe made specially for the work. The peculiar structure which gives this "bird's-eye" grain is seen in a transverse section of the trunk to cross it from the bark to the heart. All trees do not yield figured wood. An expert can tell from the bark of a standing tree if it is likely to be "blister" or "bird's-eye" maple. The wood is imported in logs and planks, the former

being sold by Customs string measure, and both by the cube foot. **MARBLE WOOD** or **ZEMBA WOOD, *Dispyros Karsii***, is an evergreen tree of the Andaman Islands, where it grows large enough to furnish logs about 20ft. long, from 9in. by 9in. up to 12in. by 12in. square. The wood is hard, difficult to season, and it shrinks and warps. From its being striped with black and grey it is called zebra wood; the sapwood is grey. The New South Wales and Queensland marble wood is obtained from a tree known to botanists as *Olea paniculata*; it is hard and durable. **MYALL WOOD, *Acacia pendula***, grows in New South Wales and Queensland; it is from 25ft. to 30ft. high, and from 16in. to 18in. in diameter. It is also called violet wood, for when cut it gives off a scent like violets. It is dark-brown, hard, and compact-grained, easily worked, and used chiefly for cabinet-making and tobacco pipes. A variety found in Victoria, *Acacia homalophylla*, also emits a strong smell of violets when cut. It is used for similar purposes as that found in New South Wales. Myall wood is sold here by weight, in pieces not quite one hundredweight each.

PROTECTION AND PRESERVATION OF WOOD FROM FIRE AND DECAY.*

THE problem of wood protection, of converting it from a highly inflammable into an absolutely non-inflammable product, has floated before the minds of generations of men rather as a vague, dreamy proposition than as subject-matter upon which to concentrate intense intellectual attention. Sporadic efforts, void of practical utility, are historically recorded at irregular epochs, from Roman days to the present time. So little is known by the general public of the practical results achieved in the line of protection of wood from fire, that it is a tax upon its credulity to ask it to believe that the wood of a structure can simply, rapidly, and cheaply be rendered as non-inflammable as brick or stone. It is even likely that such a statement may be questioned here and now. It is not claimed that wood cannot ultimately be disintegrated and destroyed by attacking flame, as we know brick, stone, and steel may be; but it is claimed that wood may be so treated, and that the wood before you is so treated, that, upon the withdrawal of such flame, it will not of itself, except perhaps momentarily, hold flame, whether in beam, board, or splinter. If this be literally or even measurably true, what is its significance? Many years ago, in a great fire on Chestnut-street, below Third-street, in this city, the heat was so great as to disintegrate enormous masses of the granite walls. If wood is robbed of its inflammability, it is voided of its most serious objection in a structure. If the wood in a building will not inflame from fire attack, but only slowly disintegrate, as other non-inflammable materials will from contact with fire, then the contents of the building alone can be destroyed by fire in the building. Further, if the contents of a room inflame and the wood will not, then the fire can be localised, because the wood will not receive or transmit flame. The elimination of the inflammable characteristic from wood is therefore a matter of vital consequence. And such treatment, further, as shall cause it to resist disintegration from fierce heat the greatest length of time, without at any time inflaming, must be the most desirable. The sum of values arrived at, as a resultant of all recorded study, invention, and scientific deduction, up to the beginning of the present decade, as to protective treatment of wood, may be stated as:—

1. That wood is susceptible of absorbing varied percentages of liquids.
2. That certain chemical solutions, when injected into the cellular structure of wood and afterwards dried, leave a residual deposit of dry chemical therein, from which, with water, the solution was originally formed.
3. That such impregnation may be effected by pressure mechanically applied and by incidental processes.
4. That such deposit of chemical substance in the wood cells has in one case a preservative and in another a fire-resistant effect.

Practically, this formula condenses the whole state of the art up to a very recent period. The mechanical saturation of wood is really a new art.

* Extracts from a paper by Mr. Joseph L. Ferrell read before the Engineers' Club of Philadelphia, and published in the *Proceedings* of the Club.

It found its first concrete development less than thirty years ago, in apparatus designed to saturate timbers with preservative solution. Previously abortive efforts had been made on a smaller scale, but were of no practical account. Strangely enough, the preservative proposition claimed first attention; and as the work to be done required capital, capital called upon the engineer to formulate the apparatus with which to saturate the wood. The original theory of saturation, in its processional steps, is practised to-day with but slight modifications. Fourteen preservative plants exist in this country, five in England, three in France, and five in Germany, as reported. All have the original typical apparatus and system of saturation, so far as can be ascertained. The belief prevailed, and prevails, that the interfibrillar and cellular system of wood contained elements denominated sap, which, according to recognised authority, was vicious, and generative of destructive fungus. No distinction seems to have been made between the *real sap*, the solid deposit, and the *sap water* which came to the tree heart from the ground laden with vital power, performed its function, parted with its tree food, and failed to find its way as simple water into the atmosphere, only because the tree was cut down. This *sap water* is very favourable to the propagation of germs, and is therefore really an undesirable element in wood. But the sap water is very small in amount in lumber cut for any time, and there is no reason whatever for any effort to eliminate it. For if the preservative solution is of any strength or value, it will impregnate such sap water, and utterly destroy any germinative tendency. But the fact is that every effort is actually made to liquefy the *real sap*, the soul of the wood, and suck it out by vacuol extraction. The real bottom fact of the matter is that the original creator of the theory of saturation realised that, in sappy woods like yellow pines, the sap, being in such large volume, would resist saturation, and the only way he could see to get over the difficulty was to liquefy the sap by steaming, and exhaust it by the vacuum-pump. Within the last two years a statement was made in a scientific journal, describing this process, that this result was so successfully accomplished as to "leave the wood in a condition of a finely divided honeycomb." Comment on such a statement is superfluous. The steps of process by this original method of saturation are, after the cylinder is charged:—

1. To introduce steam to liquefy the saps.
 2. After prolonged steaming, to remove by vacuum pumps the substances so liquefied, the operation requiring many hours.
 3. To fill the cylinder with the preservative solution, allowing it to impregnate the wood, so far as it will, by its own infiltrative action.
 4. Then applying hydraulic pressure to complete the saturation. This apparatus and process mark the first systematic effort to produce a commercial result in the saturation of wood, and it has been continued from the first until now, with immaterial changes, as the universally adopted type.
- That the business of preservative saturation has not obtained universal acceptance may proceed from several causes:—

1. The process of saturation occupies undue time, rarely taking less than 24 to 30 hours for a charge.
2. Heart saturation in timbers of moderate square section is incomplete.
3. It is believed that the strength of the wood is seriously impaired by the processional steps, steaming and exhaustion of the liquefied sap.
4. The chemicals put into the wood, being excessively dilute, are ineffective.
5. That the exposure to atmospheric influence causes them to volatilise.
6. That the cost for such a modified result is excessive.

At any rate, it is manifest that the growth of treatment of wood with preservative is sluggish, and not at all in proportion to the advance in price of such woods. It would seem that, if it were clearly demonstrated that ties, piles, and bridge-timbers could be saturated at reasonable cost with a preservative which would treble or quadruple their average life when untreated, in a country like ours one hundred plants would scarcely suffice to meet the demand, instead of fourteen in thirty years. The advance in cost of ties, owing to the great railroad development of the country, and rapid exhaustion of the timber, has, however, induced a number of the Middle West and Western railroads to put in plants of the old type,

to treat ties, and their growing use is evidence that it is found an economy, even with the crude apparatus and an expensive chemical. Observation of the operation of the mechanism and processes employed, and a study of wood and its susceptibility to absorption of liquids, led to the conclusion that the desired results could be obtained by much simpler mechanism, and an entire reversal of process. The old form of apparatus consisted of a cylinder of from 62 to 84 in. diameter, and from 85 to 112 ft. long, closed at one end, having a massive door at the other, swinging either horizontally or lifted vertically. This door is fastened by a multilocking system of bolts passing through lugs on the periphery of the cylinder. It is obvious that an external joint of from 62 to 84 in. diameter which has to be opened, say, once or twice every twenty-four hours presents a practical difficulty of great significance when it is desired to make it absolutely tight against any considerable pressure from within. If it leaks badly, no uniform pressure can be maintained. Further, perfect saturation, even of lin. thick white-pine boards, cannot be effected in any practical time unless a pressure of at least 175 lb. is applied for several hours, no matter what preliminary process may have been employed. If a pressure of 175 lb. is put on the 84 in. gate-area, it has been found impossible to maintain a tight joint and even pressure. If much leakage occurs, the pressure-pump must take it up, and, in speeding up, its reciprocating shocks, delivered against wood whose exterior surface has been softened by previous steaming, exert a most damaging and disastrous effect. Therefore, the method of employment is to use, as that part of the process, a lower pressure, and avoid the rupture of the joint and damaging compression of the wood; but this is accomplished only at the cost of a great extension of time. The new method wholly abandons all preliminary process. It was found from long practical testing that it was erroneous in principle, uncalled for, enormously expensive, and practically ineffective. As stated in published descriptions, saturation of boards and planks by the old system required from 24 to 40 hours. The new mechanism is, instead of a cylindrical body of 84 in. diameter, 50 in. in diameter, and 112 ft. in length. The cylinder body is made up of cast-steel flanged sections, 2 1/2 in. thickness of metal, with a special hydraulic joint at the flanges capable of enduring a hydraulic pressure of 1,000 lb. per square inch. At each end is a domed gate, with a vertical hydraulic cylinder superimposed, which operates a vertical gate-valve weighing five tons. The gate is provided with phosphor-bronze rings, as also the inner and outer guide surfaces. When the internal operating pressure comes upon the gate, these ring surfaces coincide, and the joint is perfect, whether with 10 lb. or 1,000 lb. pressure. The greater the pressure, the tighter the joint. In this case it is the reverse of the old externally-applied gate. Furthermore, all possibility of communicated shock from the pressure-pump is obviated by the interposition of a hydraulic accumulator loaded to the normal saturating-pressure of each kind of wood. For white pine the normal saturating-pressure is 300 lb., yellow pine 350 lb., ash 400 lb., chestnut 400 lb., beech, birch, and maple 450 lb., oaks 650 lb.; and the direct saturation in this machine of lin. thicknesses of woods can be performed under these pressures because of the absorption of shock from pressure-pump, with perfect results to the wood, and in a small fraction of the time required by the old system. The wood is simply taken as it comes from the source of supply, put in the cylinder, the gate is closed, the cylinder is run full of saturating liquor, pressure is applied, liquor is returned to the tanks, the lumber is run into dry kiln, and another charge of lumber is run into the cylinder. The process is identical whether the wood is saturated with preservative or fireproofing solution, with this exception: The growth of experience demonstrated that the criticism of engineers regarding the non-permanence of the preservative solution hitherto injected into ties, piles, beams, &c., was a just criticism. It would seep out, slowly, perhaps, but inevitably, under varying atmospheric conditions. For instance, several railroad companies having tie-treating plants believe that chloride of zinc most effectually acts as a fungus-destroyer. Chloride of zinc is an expensive chemical, costing from five to six cents per pound. Therefore, to be able to use it for their purpose, and not make their product too costly, they use a very dilute

solution. In its dilute form the residual protective matter left in the wood is so slight that successive rains and evaporations in a relatively short time exhaust the infused material—wash it out. Practical investigation having positively confirmed this, it was believed that for wood exposed to weather conditions no treatment would be permanent except such a one as would create a chemical double decomposition in the interior of the wood. Three years of continuous investigation resulted in the production of an apparatus applicable to the treatment of railroad ties by a wholly new method. This consisted in saturating them *individually*, instead of in mass, which can be done with great speed and absolute thoroughness and uniformity . . .

The saturation of wood to make it *fire-resistant* differs in many respects from preservative treatment. Wood treated to make it fire-resistant is subjected to many stringent requirements not essential in the case of preservative. For instance, the saturation must be complete to the heart. The colour of the original wood must not be impaired. The strength of fibre must be preserved. There must be no lingering of flame on withdrawal of attacking flame. To effect this, the strength of solution must be as high as possible. This, of course, adds to the cost and the density of solution requires greater pressure to infiltrate. The "state of the art" at the time this work was begun embodied the employment of the original apparatus above described and processes therein exhibited. This chemical, superficially studied, seemed to be all that could be desired. Wood saturated with it certainly would not *inflame*. Shavings planed from it would carry no flame. The treated wood would discolour more or less, but the refusal to carry flame seemed so admirable a result that such a defect seemed trifling. Longer acquaintance, however, destroyed the illusion. Familiarity bred contempt. Sulphate of ammonia is a whitened sepulchre. It discolours wood. It effloresces and loses its virtue. It is hygroscopic and destroys paint and varnish. It decays wood inevitably. Its resistant virtue is excellent *while it lasts*, but its endurance against attacking flame is brief. For instance, if we stand vertically a piece of untreated lin. white pine before a horizontal Bunsen burner so that the blue-point impinges, the average resistance to penetration and disintegration is thirty-two minutes. Similarly exposed, the average resistance of a piece of lin. white pine saturated with sulphate or phosphate of ammonia is sixty-three minutes, or an extension of life, due to the chemical, of thirty-one minutes. Now, it is an admirable result to secure immunity from fire for thirty-one minutes, if no better result could be attained, and know that woodwork will not spread flame when treated; but it is not commensurate with the cost, and is not much to be proud of. Universally understood, it would not be considered a valuable commercial result. The effectiveness of ammonia salts to repel flame from a wood surface depends upon the rapid volatilisation of the ammoniacal gas. The greater the applied heat, the more rapid the exhaustion of the protective gas, and, when exhausted, no residual inert substance remains to bar the advance of flame or progress of disintegration. The gaseous emission chemicals were the only known materials used, up to five years ago, in any commercial fireproofing plant. It became necessary to seek for practical materials, operating on a *reverse principle* from the gaseous emission, and after years of laborious effort sulphate of aluminum was discovered to be the substance endowed with the property of fire-resistance inconceivably beyond any previous conception. For instance, the best results from the *gaseous emission* substances was an added life over untreated wood of thirty-one minutes. Now the average of 2,800 pieces of lin. white pine treated with sulphate of aluminum has an added life of seven hours and thirty-eight minutes, or over fourteen times that of wood treated with the gaseous emission chemicals. The most satisfactory result comes from the simple fact that sulphate of aluminum under flame loses its water of crystallisation, its sulphuric acid of combination, and remains then *residual pure aluminum* which has the admirable property of expansion in the vacant cells of wood, to two and one-half or three times its original volume of dry sulphate; and in doing so it interposes between flame and wood fibre a compact mass of pure alumina, infusible by the flame of any conflagration, and an admirable non-conductor of heat. It appears, therefore, that the fire-resistance achieved in saturated wood proceeds from the *massing within*

of an inert and infusible substance, which from its non-conducting character *bars* destructive heat and produces endurance of the mass, and absolute negation to flame, for a prolonged period of time. This, as the best result, seems to assure that the *massing principle* is the correct one; and it is further illustrated and confirmed by the extension of it in a wholly different application. A casual remark was made over two years ago by a prominent insurance man, to the effect that the saturation of wood by sulphate of aluminum was assuredly a great gain to it in fire-resistant quality, but that *he* was quite as much, if not more, interested in the preservation of *existent* structures, from attack by fire, than *he* was in preparation for protection of non-existent structures, or those only in contemplation; and he counselled the serious study of this phase of wood treatment. The proposition, in view of the small results accruing from the multitudinous so-called fireproof paints, was by no means an encouraging one; but the powerful results accomplished on the *massing principle* in the cellular structure of wood bodies indicated the direction to be a *massing* of a series of chemical solutions on the external faces of wood bodies. A wholly new set of phenomena appeared for consideration: All paints known to the writer, applied to the superficies of wood, on the application of heat break up sooner or later, scale off, or otherwise disappear. The attachment to the superficial cells of wood seems to be slight, and to effect a *bond* the *penetrative* effect of an initial application should be marked. A chemical substance was discovered possessed of extraordinary penetrative power, a simple application entering below the surface even of oak 1/2 in. By subsequent coatings, other chemicals, *making chemical union* with the first, insured adhesion and condensation, and an *enamel, not a paint*, grew upon the wood surface, possessing a fire resistance over six times, on the average, that of wood treated by sulphate of ammonia solution diffused throughout the entire wood body. The problem involved the discovery of a *transparent enamel* for hard and fine woods in interior work. It compelled the discovery of means of application to woods covered with old paints and old varnish; the ability to absorb and receive on its surface lead or zinc paints when required; and it finally led to the discovery of means of incorporation of all shades of colouring in the massed enamel, so incorporated as to be proof against wear of weather exposure, and by such incorporation to preserve indefinitely the original freshness and brightness of the colouring matter. The palpable results of this work are before you. The aim has been to honestly and most practically cover the whole ground of wood protection from the attacks of flame and fungus. It is not for a moment claimed that wood treated by these processes is absolutely impervious to fire; that such wood is irreducible by fire; but it is believed that by these processes and chemical solutions wood has gained a large immunity from attacking flame, and that in each instance it will only disintegrate after the flame has persisted for such a great length of time that ample opportunity will be given for extraneous aid to extinguish it. In going over the ground of results accomplished in the more effective protection of wood from fire, the vital value seems to be that its treatment produces unquestionable *non-inflammability*. It thus becomes a determined fact that wood thus treated, sustaining no flame itself, can communicate no flame; and attacking flame can endure only so long as its original fuel-supply remains unconsumed. Therefore, a fire originating in untreated contents of a structure will consume such untreated contents, and may blacken and roughen the surfaces of the structural wood, but can never excite any flame thereon if the fire-resistance resulting from treatment is efficacious, and must necessarily be limited to the radial distance of the extension of the projected flame.

These facts are not only proved by minor tests, as those before you; but in case of actual structures of treated and untreated wood of practical dimensions erected for comparative observation.

RAISING A CHIMNEY STACK.

THE extension of a brick chimney shaft is often required, and the following account of the addition of 50 ft. to the height of a stack for the power house of the Columbus Railway Company is of interest. The shaft was originally 8 ft. in diameter inside and 16 ft. externally

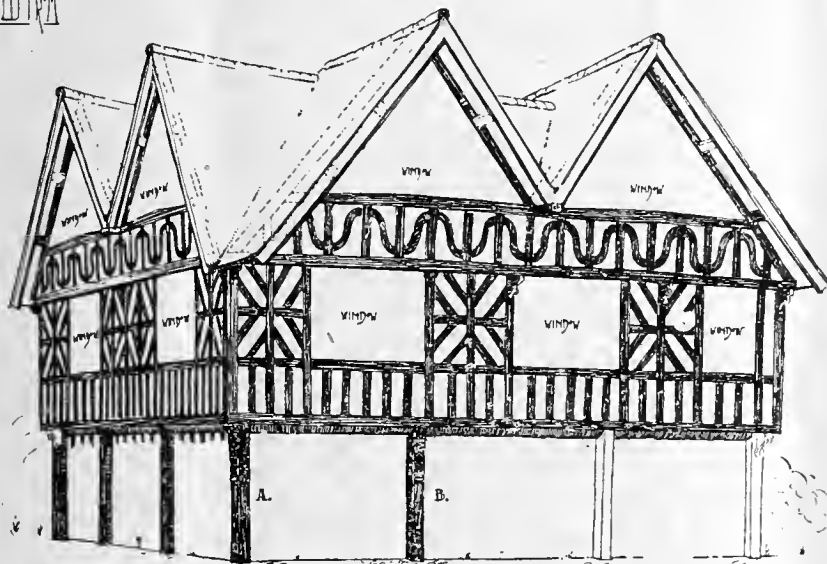
16TH-CENTURY HALF-TIMBERED HOUSES, STRATFORD-ON-AVON.

SKETCH OF THE BUILDING
AS IT APPEARED WHEN BUILT
TAR AS CAN BE TRACED FROM
THE REMAINING TIMBER.

THERE IS NO TRACE OF
TIMBERING IN ANY OF THE
GABLES REMAINING.

THE SECOND STORY BAYS
WERE PROBABLY FILLED WITH
WINDING AND PERPENDICULAR
RAFTERS, THE LATTER
HAD TRACES OF THE LATTER.

IN ALL TIMBER
WORKED IN CAN
BE TRACED

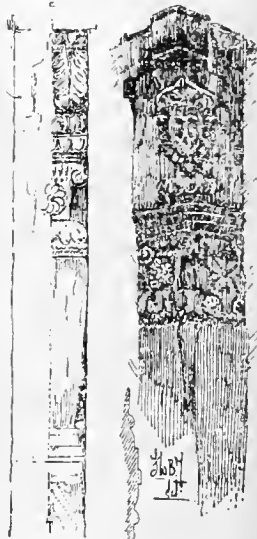


TILE ST.

HIGH ST.

CARVED STREY D'S

CARRYING
PARTIALLY
DESTROYED



DUAL A.B.

DUAL C.A.

at the top, larger at the base. It was 160ft. in height, and the shaft was built with double walls enclosing an annular air space. It had a cast-iron cap. After the introduction of mechanical stokers, &c., a heightening of the shaft was required for increasing the draught. The extension was made without interrupting the service. The cast-iron cap was removed, and on the top of the cleaned brickwork a single shell of brick 50ft. high, supported entirely on the outer wall of old chimney, was built. It has a batter of 9 : 600. By means of a line carried up by a kite the ropes and tackles were pulled up, men ascended, and attached, by means of chains round old shaft, light radial angle-iron brackets, which were secured and boards were laid on them, forming platforms for two masons and a helper. The smoke, heat, and fumes were such that a light sheet-iron cylinder, 3ft. or 4ft. high, was placed on top of brickwork to protect the workmen. The new brickwork was built of the Custodis standard radial bricks, without metal ties, anchors, or any reinforcement. The platforms were placed 5ft. apart vertically, two or three being in use, and the lower one being constantly removed and placed above the other two. Details of the added structure and the scaffold bracket used are given in the *Engineering Record*. From the section of the new shell, the outer diameter at the bottom, where it rests on the old chimney, is 13ft. 3 $\frac{1}{2}$ in., and the diameter at top 11ft. 9 $\frac{1}{2}$ in., or 10ft. 7in. in internal diameter. The shell is built in three stages or sections: one of 17ft. 2in. at bottom, and two of 16ft. 5in. The thickness of the bottom section is 10 $\frac{1}{2}$ in., the section above 8 $\frac{1}{2}$ in., and the upper section 7 $\frac{1}{2}$ in. In this case the radial made bricks insure a stable shaft. The Alphons Custodis Chimney Corporation Company were the contractors.

unrecognisable. The walls were bricked or studded, and covered with stucco after the style of that period. The two front chimney-stacks were probably added at the same date. It was at first feared that the building was past preservation; but ultimately it was, fortunately, found that enough of the old timbers remained to trace the original construction and to restore the work sufficiently to bring out the history of the building. The work has been carried out by Mr. G. T. Kennard, contractor, Stratford-on-Avon, under the direction of Mr. E. G. Hulston, architect, of that town.

A FERRO-CONCRETE SUBWAY.

THE subway structures of the Philadelphia Rapid Transit Co. will be a good example of ferro-concrete construction when completed. The subway has an outside width of 55ft. and a height of 19ft., with concrete walls 3ft. thick, and a concrete roof 2ft. thick, and a floor of about 17in. minimum thickness. The roof slab is a continuous mass of concrete, reinforced by longitudinal and transverse horizontal steel rods 2in. and 1 $\frac{1}{2}$ in. in diameter and 18in. and 6in. apart respectively. In the centre it is supported on three longitudinal rows of riveted steel columns, I-shaped in section, made with four 5 \times 3 \times 3 $\frac{1}{2}$ in. angles. They are seated on the concrete floor of subway, have bottom flange angles, and they project half-through in roof slab, which is specially reinforced above them by 2in. rods, distributing the column reactions on the concrete. Details are given in the *Engineering Record*. The columns are connected below the roof slab by continuous longitudinal girders of two 12in. channels, and these girders are filled with concrete, which is also moulded round them to form solid reinforced beams integral with the roof slab. The concrete is of Portland cement in proportions of 1 : 2 $\frac{1}{2}$: 5; the outside walls are of cinder of slag concrete 1 : 2 : 6. The bulk of concrete used is made of 100lb. of cement, 2 $\frac{1}{2}$ c.ft. of sand, and 5c.ft. of stone. The floor is composed also of concrete, having three longitudinal inverts between the rows of columns. The whole structure is made to form a compact mass of concrete. Mr. W. S. Twining, C.E., is the chief engineer, and Mr. Chas. M. Mills, C.E., the principal assistant engineer. A great many details of the construction and obstacles met with are given in the *Record*. It will be seen that the tensile stress is taken by the steel rods which are near the soffit of roof slab and the compression by the concrete. The roof is covered by asphaltic mastic. Longitudinal rods, 2in.

diameter, about 6in. apart, are placed near the top of roof slab, which serve to hold the concrete together and to distribute the stresses. The subway will be completed in about two years.

CONCRETE SEWER AT COLDWATER, MICHIGAN.

THE construction of a concrete sewer with a monolithic invert and an arch composed of blocks was described at the annual meeting of the Michigan Society of Engineers. The city of Coldwater, Mich., with a population of 6,216 in 1900, is built upon very flat ground, the streets have never been properly graded, and during the summer of 1901, Messrs. Riggs and Sherman, of Toledo, were engaged to design a trunk sewer to replace an old 18in. tile, which was entirely too small. Bids for this work were asked on three different designs: (1) brick; (2) concrete, with the semicircular invert a monolith 8in. thick and the arch composed of 11 concrete blocks; (3) concrete composed entirely of blocks. These blocks were to be 24in. long, the intrados to conform to the arc of the sewer subtended by a chord 5 $\frac{1}{2}$ in. long, and the extrados to a chord 8in. long. The diameter of the sewer was 42in. The lowest bid for the brick sewer was 340dol. per linear foot, and that for concrete with monolithic invert 3dol., the other bids being rejected. The cost of the concrete was influenced by the fact that Portland cement could be obtained for 1.25dol. per barrel, delivered on the work, and that an excellent gravel was very abundant in the neighbourhood. Mr. Harry V. Gifford, of Bradner, O., was the engineer in charge of construction.

The work of preparing the blocks was started early in September. Some 8,500 were required, and in order to give them as much time as possible to set, the majority of this work was done before excavation on the trench was started. Moulds were made of 2in. lumber, and lined with tin, and the four sides of the mould formed the extrados, intrados, and two ends of the block, the remaining two sides being open, and the whole held together by screws or wedge clamps. The moulds were not at first lined with tin, but after a little use the concrete stuck to the sides when the mould was removed. The mould when put together was laid upon a mould board 1in. by 12in. by 30in., reinforced by cleats across the bottom. When the block was completed, the mould was carefully taken apart, and mould board and block were carried out and laid upon a stretch of sand that had been levelled

SIXTEENTH-CENTURY HALF-TIMBERED HOUSES, STRATFORD-ON-AVON.

THESE houses, which are situated in High-street, have recently undergone considerable alterations necessary for their conversion into business premises and a dwelling-house. The houses date back to the early part of the 16th century, the character of the timbering and remains of Early Renaissance carving on the story-posts being a fine example of the style of the period. The buildings have been much pulled about from time to time, the most important alteration being made some hundred years ago, when the roof was reconstructed in order to add an upper story. In doing this the timbered gables were pulled out, and the work so badly mutilated as to be almost

to receive them. This block was left upon the board until, by careful handling, it could be removed without injuring it. After being removed from the board, it was allowed to remain on the ground for three days, after which it was placed upon the pile. The blocks were watered several times each day for at least a week. Very few blocks were broken, which was rather remarkable, considering their weight of 90lb. each, and the green condition in which they were handled.

A gang of fourteen men was all that could be conveniently worked—two to screen gravel, four to mix concrete, four moulders, three men to shift and water blocks, and one foreman. The work was done in a gravel pit owned by the city, and this materially reduced the cost of the blocks. The contractor did not have to pay for the gravel; but to offset this he afterwards gave the city whatever gravel was needed from the trench. With a little practice each moulder could turn out 175 blocks a day. Each batch of concrete containing one-half barrel of cement would average eighteen blocks. This would make the cost of each block between 11 and 12 cents, figuring 85 cent on each block for use of moulds and mould boards, which were entirely lost. It is Mr. Gifford's belief that it would have been more satisfactory had the blocks been 18in. long instead of 24. Although a man can make a block 24in. long about as quickly as 18in., and it is not necessary to handle as many blocks to build a given distance of arch, yet the greater rapidity and ease with which the smaller blocks can be handled and the decreased liability to break or chip them would offset the advantages of the longer block, from the contractor's standpoint as well as that of the engineer.

The gravel obtained from the bank was of an excellent quality, and very free from clay or other impurities. A stratum of pebbles from which all the sand had been washed ran horizontally through the bank. These pebbles, when caved down and mixed with the gravel beneath, easily balanced whatever surplus of sand occurred in the other gravel. This was all screened through a riddle with meshes 1in. apart. The concrete was mixed in the proportion of 1 part American Portland cement to 6 parts of gravel.

The material encountered in digging the trench was loose clean gravel, with the exception of the bottom foot or two, which in some places was a sandy loam. Every foot had to be sheathed and thoroughly braced, and constant watch kept on the banks even then, for they would crack off in long stretches from 3ft. to 5ft. back of the sheathing. The horizontal method of sheathing was first used, and proved quite disastrous to the contractor, for in driving it down it greatly increased the natural tendencies of the banks to cave. It could not be as readily handled as the vertical form, and after the top part was removed, the banks would cave, making it impossible to get out the lower courses. The vertical method was much more rapid and satisfactory.

When the trenching had reached the approximate grade of the top of the invert, stakes were driven in the bottom about 5ft. or 6ft. apart, in lines a distance each side of the centre line equal to the radius, plus the thickness of the shell, plus 1in. These stakes were driven to such a grade that the top of a 2 by 4 set edgewise upon them would be at the proper grade for the top of the invert. The invert was then excavated to form approximately to the outside of the finished sewer, and afterwards made to conform exactly by a semicircular templet of the proper dimensions, drawn along the runners. Where gravel was found in the bottom, it was impossible to hold the shape exactly; but where loam was found, the excavation could be made perfectly true. Concrete was thrown in, and with shovels and rammers was worked into approximate form without the use of moulds. The only part that was difficult was to get the inside shoulder on both sides to stand up square. This could be accomplished by holding a float or a board along the inside, filling in behind it with concrete and tamping it down. A form was tried in making the invert, built very much like the centre used for arches of brick sewers, except that about one-third of the centre of the arc was left out. This form was about 6ft. in length, and was suspended in an inverted position from cross boards resting upon the runners. The bottom of the invert for about one-third of the semicircle was made to approximate dimensions; the form was then set on the runners over this partially pre-

pared spot, and concrete was filled in on both sides, between the outside of the form and the side of the trench, and thoroughly rammed. The form could then be lifted off and the invert trued up. This gave very good results, the only objection to it being that the form was too large and clumsy, and was in the way of the workmen. It could be used with success in a soil where the excavation could be prepared a number of feet ahead, so that the form could be drawn along as each section was completed; but in soil like that at Coldwater, where the placing of the concrete must closely follow the preparation for the invert, this form was in the way. Either method gave an approximate form to the concrete, which was trued up by means of a semicircular templet with a radius of 21½in. This left the surface of the concrete ½in. larger than the finished invert. While the concrete was yet green, a heavy coat of 1:2 mortar was roughly trowelled on. This in turn was brought to its true dimensions by drawing along the runners a third semicircular templet with a 21in. radius. This left the surface perfectly true, and both concrete and plaster of proper thickness. Smoothing it down with a trowel was tried; but a section thus treated was found to be so far from its true form that the practice was given up after the first day.

When the coat of plaster had become hard, two tiers of blocks were laid up to a line upon each shoulder of the invert. The mortar was composed of 1 part of American Portland cement, 2 parts of sand, and ½ part of slaked-lime plaster. The lime made the mortar so much richer and so much better to work, and the joints were so much better laid, that it fully offset what little weakening effect it had, if any.

The form for the centre was then put in place, and the rest of the arch built up, care being taken to break joints. As each section (about 8ft. in length) was completed, a thin grout of equal parts of cement and sand was poured over the top, and worked into all the joints. Gravel was thrown upon each shoulder of the arch and tamped down, and the centre moved ahead.

CHIPS.

The Bishop of Lincoln on Thursday week opened a new church on the Waterside-road, Barton-on-Humber, in connection with St. Chad's Mission. The church will accommodate 300 persons.

Mr. H. Ross Hooper, Local Government Board inspector, held an inquiry at Pontefract last week into applications by the town council to borrow £154 for works of sewerage in Beech Nut-street; £3,200 for the purchase and pulling down of a house and shop at the corner of Gillygate and the Market-place, for the widening of Gillygate; £500 for the purchase of land at the junction of the Wakefield and Barnsley main roads, upon which a cycle shop and factory have been partly erected by Mr. Ewbank; £107 for improvement in Corn Market, and £195 for the widening of Front-street.

A receiving order has been made, on a creditor's petition, in the Boston County Court, against Herbert Clarke, civil engineer, Boston, the act of bankruptcy being "that the debtor has, with intent to defeat or delay his creditors, departed from his dwelling or has otherwise absented himself." Mr. Jebb and Son, Boston, are the solicitors for the petitioning creditor.

During the progress of the alterations at Durham Castle a series of Norman latrines have been discovered in the north-west turret. Excavations are being made in the hope of discovering the old cells of the original castle.

At the last meeting of the Incorporated Church Building Society grants were made for building new churches:—At Broadheath, near Worcester, £80; St. Anne, Brondesbury, £150; for the first portion, Jarvis Brook, near Tunbridge Wells, £120; and St. Andrew, Southgate, £100; and towards enlarging or otherwise improving the accommodation in the churches at Dale, near Milford Haven; St. Philip, Dalston; Gilestone, near Cardiff; Great Sturton, near Horncastle, Lincoln; Lanteglos-by-Fowey, £40; Llandebie St. Tybie, Carmarthen, £30. Grants were also made from the special mission buildings fund towards building mission churches at Bensham, near Gateshead-on-Tyne, Newlyn, and Newtown St. John, near Beaufort, Mon. In addition to this, the sum of £130 was paid towards the repair of 13 churches from trust funds held by the society.

In Indore, the Sherpur Palace is to be completed as a residence for the young Maharaja, the Rampur Kothi in the Lal Bagh rebuilt in elaborate style, and a new Residency designed and erected. The architect for all these works is Mr. C. F. Stevens, of Bombay.

SKETCHES IN NORMANDY.

THE sketch of Mont St. Michel is made from the eastern bastion, which affords the finest and most comprehensive view of what is undoubtedly one of the most picturesque and romantic spots in the world. The whole island is one massive rock rising sheer out of the sea 257ft., crowned by the abbey, the highest pinnacle of which is 400ft. from sea-level. The massive fortifications all round, the monastic buildings built into the rock on all sides, and the grandeur of La Merveille which stretches along the south side of Mont form a delightful contrast to the choir of the abbey with its forest of delicate pinnacles. The nave of the abbey dates from 1260, and the choir from the end of the 15th century.—Dol Cathedral is one of the smaller and more simple of the French cathedrals. Its simplicity arises from the material of which it is built—namely, the hard granite of the locality. It dates from the 13th century. The sketch shows the large porch of later date attached to the south transept, which is interesting for the massive piers at the corners, also the low square tower over the crossing of the transepts with the nave.

REGD. T. WHEATLY.

OBITUARY.

GEORGE FOSTER SHEPLEY, of the well-known firm of Boston architects—Shepley, Rutan, and Colledge—died July 16 at St. Moritz, Switzerland, where he had gone for the benefit of his health. He was born in St. Louis in 1860. He studied at Washington University, and afterwards, in 1882, was graduated from the Massachusetts Institute of Technology. He entered the office of H. H. Richardson, where he studied until that gentleman's death, and the firm of which he was the head was then formed. Of the many imposing buildings that the firm has designed throughout the country in the succeeding period the following are representative:—The Ames Building, the Chamber of Commerce, South Terminal Station, Back Bay Station, and New Congregational House in Boston; the Art Institute, Chicago; Leland Stanford Junior University, California; and the new union station, Albany. He was a Fellow of the American Institute of Architects.

The Wallasey Council Health Committee have recommended the appointment of Miss Isa Birrell, of Rock Ferry, as female sanitary inspector, at a salary of £70 per annum with uniform, out of 28 applicants for the position.

In January last the Bishop of Carlisle appointed a commission to consider the need for the extension of spiritual provision in Barrow. The commission has now reported, and suggests the building of a new church, to accommodate 600 worshippers, on Walney Island, on a site given by Messrs. Vickers, Sons, and Maxam, adjoining the present church and burial-ground; that the site for a new central church be secured in Abbey-road, at a cost of £4,000, capable of accommodating 1,600 worshippers, and removal of St. Mark's Church to some other part of the parish, and its rebuilding as a separate church; and the securing of the site for a new church on Barrow Island, with a view of building a large church and a convenient mission-room.

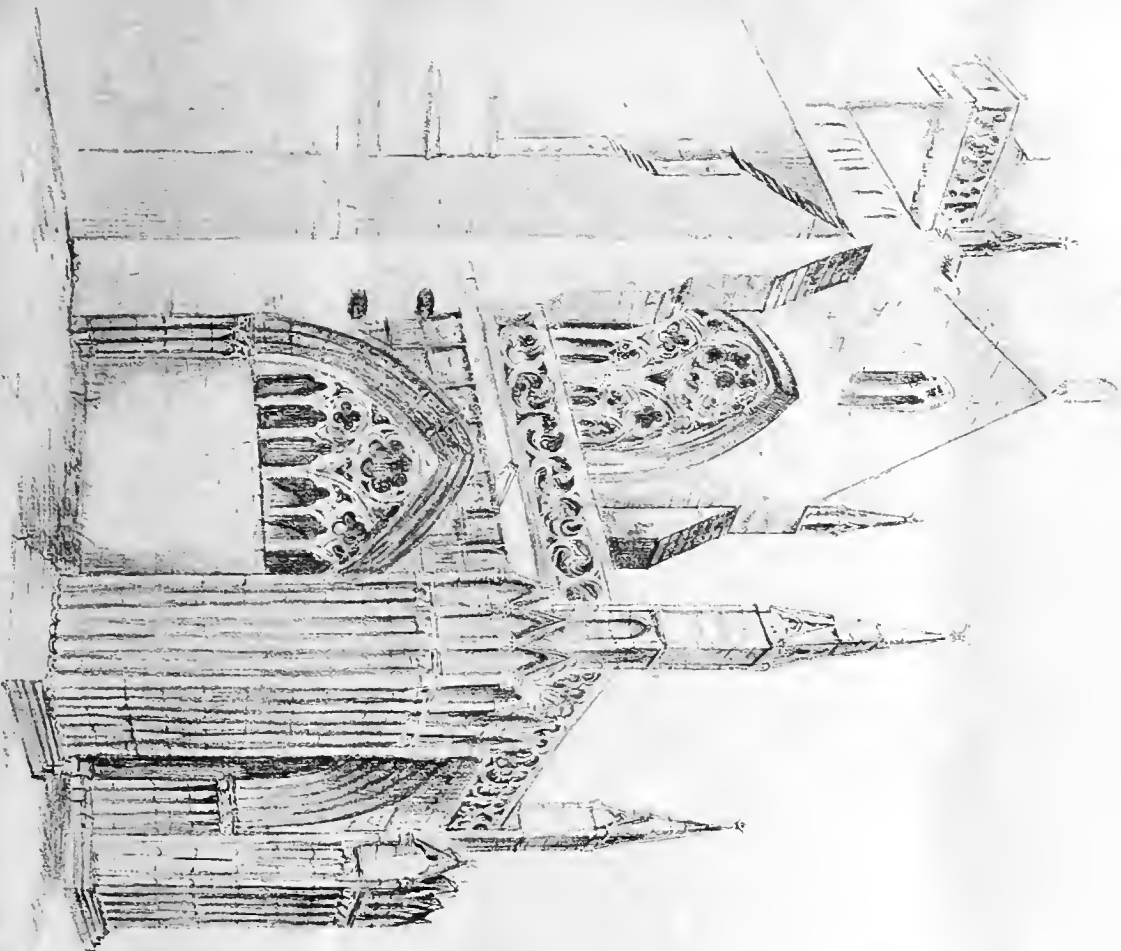
In Lichfield Cathedral on Saturday last two memorial windows were dedicated, one in honour of the Staffordshire Yeomen and Volunteers who fell in South Africa and the other to the memory of Lieutenant-Colonel Sir Horatio Page Vance. The Staffordshire window contains figures of Gideon, Moses, and David—Gideon and his companions being represented blowing the trumpets, Moses stretching out his hand over the sea, and David with his sling. The Vance window has figures of St. Oswald, St. George, and St. Alban, accompanied with suitable mottoes.

Immediately below the figure of St. Mildred, the patron saint of Whippingham Parish Church, Isle of Wight, was placed last Friday a memorial tablet containing an inscription in a 14th-century church text letter, of alabaster on a background of ornate gilt, the effect of which is strikingly beautiful. The new reredos is in alabaster. The central panel depicts the Last Supper in white marble, whilst the side panels represent the emblems of bread and wine.

Mr. John Macpherson Grant, Provincial Grand Master of Inverness-shire, laid the foundation-stone of a new Masonic hall for Lodge Fort William No. 43 last week. When the stone had been laid, the Provincial Grand Master said it was 160 years since the foundation-stone of the old Lodge was laid in the High-street of that burgh.

SKETCHES IN PENCIL

St. John's Church
June 9, 1902



St. John's Church
July 6, 1903



Finch

Building Intelligence.

BATTERSEA.—The Battersea Borough Council have completed the erection of over three hundred self-contained dwellings for the working classes, all of two stories high, with accommodation for 1,500 persons, on the Latchmere estate. The new dwellings are destitute of architectural adornment, but will compare favourably with any others of the kind in London. There are a few five-roomed houses to be let at 11s. 6d. per week; 69 containing two three-roomed tenements, with separate entrances, at 7s. 6d.; and 73 containing two four-room tenements, at 10s. and 10s. 6d. per tenement. The council provides water and pays all rates and taxes. The dwellings are lighted throughout by electricity on the "penny-in-the-slot" principle. Each tenement is provided with a combined kitchen range, copper, and bath, including a shower-bath. The windows are fitted with Venetian blinds, and there is a garden to each tenement, accessible from the upper floor by means of a staircase. The main frontage is in Shepcote-lane, opposite the South-Western Railway line.

BLYTH.—New club buildings for the Blyth and District Social Club were opened on Monday from plans prepared by Mr. John Gouling, of Blyth, and the estimated cost is £7,000. They provide on the ground floor a bar-room, a large parlour, and two smaller rooms, together with four bathrooms and the necessary adjuncts. The space on the first floor is utilised in providing a billiard department. Adjoining there is a refreshment bar and games room, and near the stairhead the directors' room. On the second floor there is a large hall for meetings, lectures, and conferences. The news-room and library are also situated on this floor. In addition, the manager's apartments are provided.

BRISTOL.—The new Stock Exchange at Bristol has been opened. The Renaissance style has been adopted. It has a long frontage to Nicholas-street, the central portion of the front elevation for some length projecting beyond the line of the main building. The interior of the premises comprise, on the ground floor, entrance lobby, hall, secretary's office, telephone room, and the main Stock Exchange. The exchange is elaborately furnished, and the walls are lined round with richly-polished walnut panels of a handsome design to a height of about 9ft. In the centre of the wall facing the door is arranged a chimney-piece rising to a height of about 14ft., an arrangement of polished walnut pilasters with arch between, framing a piece of wood sculpture. This panel, which is about 5ft. 6in. wide by 3ft. 6in. high, was carved by Mr. Benjamin Creswick. The title of the panel is "Commerce uniting the Nations." The whole of the walls of the approach and staircase are lined with tiles of special design, whilst the walls of the exchange and library are of oak. The architect of the building is Mr. Henry Williams, and the builders were Messrs. Cowlin and Son.

GLASGOW.—At a sitting of Glasgow Dean of Guild Court last week, the following linings were granted:—The Craigton Brickmaking and Feuing Company (Ltd.), to form a street between Ell-road and Craigton-road; Glasgow East-End Industrial Exhibition Association, to alter and add to the East-End Exhibition; George Riddell, Craigmiller, Dumbreck, to erect tenements in King-street, Calton; William G. Davidson, house factor, 55, Bath-street, to erect seven tenements of dwelling-houses and offices in Oran-street and Percy-street, Maryhill; Glasgow Parish Council, to add to and alter Barnhill Poorhouse; the Corporation of Glasgow, to erect workshops and offices in Stirling-street; Sir John Stirling-Maxwell of Pollok, Bart., to form streets on the lands of Shawlands; James Lindsay, Adzell Lodge, Edinburgh, to form a new street from Winton Drive; J. and T. McNair (Ltd.), 59, Bath-street, to form two streets off Gourlay-street, Springburn; also to erect five tenements of dwelling-houses on a new street off Gourlay-street; Angus Murray, engineer, Strathroy, Dumbreck, for the Anderson Foundry Company, Craigton, to erect engineering works on the south side of Craigton-road; John Maxwell, builder, Maryhill, to erect five tenements of dwelling-houses at Crosbie-street, Maryhill; John Nisbet, architect, 112, Bath-street, to erect 21 tenements of dwelling-houses in Shakespeare-street and New-street, Maryhill; Peter Galloway, tailor, Glasgow, to erect six lodgings on the west side of

Montgomerie-terrace and Prospecthill-road; Mrs. Mary Watson, 317, Onslow-drive, and another, to erect two tenements of shops and dwelling-houses in Great Eastern-road.

LIVERPOOL.—Lord Derby, on Wednesday afternoon, laid the foundation-stone of a new building to take the place of the present Liverpool Bluecoat Hospital, an institution which has been in existence for nearly two centuries, and which is Liverpool's oldest charity. The new hospital is to be erected in the Late Renaissance style. It will be built of red brick, with facings of white stone, and accommodation will be provided for 250 boys and 150 girls. The site covers nearly seven-and-a-half acres. A prominent feature of the building will be a central tower, 125ft. in height, supporting a public clock and bells. The new hospital is to cost £65,000. The architects are Messrs. Briggs and Wolstenholme, F. B. Hobbs, and Arnold Thorneley, of Liverpool. We illustrated and described the building in our issue of June 26.

NORTHALLERTON.—The foundation-stone of the new hall for the North Riding County Council, which is to be erected at a total cost of about £40,000, was laid last week at Northallerton. Mr. Walter H. Brierley, of 13, Lendal, York, is the architect; and Messrs. Jos. Howe and Son, West Hartlepool, the contractors. The buildings are to be erected in the field opposite Northallerton Railway Station. The front, facing the main road, will be about 200ft., and will consist of a central block with projecting wings set back about 200ft. from the main road. The elevations are designed in a quiet, dignified English Renaissance style, the materials being of common local brick, with bright Leicester bricks for the facings, and Whitby or Farndale stone for the dressings.

ROCHDALE.—At last week's meeting of the Rochdale Town Council, the Buildings and Sites Sub-committee reported that they had resolved to employ Messrs. Smith and Cross, South Parade; E. Sykes, Milnrow-road; and T. Townsend, District Bank-chambers, to prepare a ground plan of each of the non-provided schools, subject to terms to be arranged later. It was also resolved that the offers of the following architects to prepare plans and report on the condition of the voluntary schools named below be accepted:—Mr. E. Sykes: Parish church (mixed), parish church (infants), St. Alban's (mixed), St. Alban's (infants), St. Edmund's, Oakenrod, and All Saints. Mr. T. Townsend, jun.: St. Mary's National, St. Peter's, Healey; St. Edward's, Castleton; St. John's, R.C. (mixed), and St. John's, R.C. (infants). Messrs. Smith and Cross: St. Mary's, Balderstone; St. Martin's, Castleton; St. James's, Thornham; St. Patrick's, R.C.; St. Gabriel's, R.C.; and Trinity Wesleyan. Payments to the architects are to be at the rate of 25 guineas for six schools.

WHELOCK.—The foundation stone of the new church which is being added to Wheelock Parish Church was laid on Tuesday week. The church is to be 25ft. long by 19ft. wide, and at the side will be a choir vestry and an organ chamber. The church will be divided from the nave by an oak screen. Seven steps will lead from the body of the church to the altar table, which will be fitted with an oaken rail and brass standards. The choir stalls are also to be of oak. The architect is Mr. A. Price, of Elworth, and the contract has been placed with Messrs. Birchall, of Middlewich. The cost will be about £500.

The Italian Minister of Public Works invites tenders in Italy and from abroad for the building of an aqueduct to provide the arid Apulian plains with water from the Apennines. There will be one main duct over one hundred and fifty miles long. The total length of main and branch ducts will be one thousand and seventy miles. The constructor will enjoy a concession of the supply for ninety years, the State providing an annual subsidy of £200,000 for twenty-five years.

The tender of Mr. Colin Macandrew, builder, Lauriston Gardens, Edinburgh, has been accepted for the execution of the whole of the works in connection with an extensive reconstruction of the barracks and other buildings at Leith Fort. The plans have been prepared by the War Office authorities, and it is understood that the total expenditure will amount to about £40,000.

Teignmouth Urban Council decided on Tuesday to apply to the Local Government Board for permission to borrow £2,000 for the purchase of slot meters and gas stoves.

PARLIAMENTARY NOTES.

WESTMINSTER ABBEY.—Mr. Channing asked the honourable member for West Derbyshire, as representing the First Commissioner of Works, on Monday, whether he had considered the proposals of the Ecclesiastical Commissioners to demolish the old residential quarter immediately south of Westminster Abbey and Deanery Garden, with a view of selling the sites for important commercial buildings; and whether, having regard to the undesirability and risk of erecting lofty buildings close to the Abbey, his Majesty's Government would make representations to the Ecclesiastical Commissioners or take other steps to prevent this proposal from being carried out. Mr. V. Cavendish: This is a matter which does not come within the jurisdiction of the First Commissioner of Works; but he would strongly deprecate any building scheme which would impair the safety or amenity of the Abbey. Mr. Channing: Has the First Commissioner no power over the height of buildings? Mr. Cavendish: No, sir, I am afraid we have no power.

WATER SUPPLY AND SANITARY MATTERS.

PADSTOW.—On Monday Padstow Waterworks were officially opened. The contracts, amounting to about £4,000, for carrying out the work were signed last November, and the agreement stated that everything should be completed by June 1, but, owing to one contractor, there was some delay, and the work was not commenced until early in the year. The new supply will be drawn from Crack-rattle, a distance of about 5½ miles. Here an adit has been driven, and the water is brought in by 5in. pipes to a reservoir at Four Turnings, which is half a mile from the town. The supply from which the water is taken has been measured at different times, and during a very dry season the smallest flow per day was 62,640 gallons. The work of trenching and laying pipes has been carried out by Mr. W. E. Bennett, contractor, Plymouth, Messrs. Merryweather being the engineers, and Mr. W. Johnson clerk of the works.

OHIPS.

At a joint meeting of the Launceston Town Council and Coronation Executive Committee on Friday, the mayor (Mr. C. B. Shaker) presiding, it was decided to erect a bungalow on the Windmill as a memorial of the Coronation.

The Egyptian Ministry of Public Works invites tenders for the construction of three road bridges over the Nile at Cairo, in accordance with the specification which may be seen in the offices of the Administrative Service of the Ministry (in London, at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W.). No tenders will be accepted which are received later than noon on February 1, 1904. Every tender must be accompanied by the deposit, either in bonds of the Egyptian debt or in cash, of a sum of £E2,000 (about £2,031).

The King has granted to Mr. Frederick Eugene Scholer his authority to accept and wear the Insignia of Knight (Second Class) of the Order of Frederick, conferred upon him by the King of Wurtemberg, in recognition of his services as architect of the Garrison Church at Ludwigsburg.

Great regret has been expressed at the news of the death of Mr. Walter Ingram, the sculptor engaged upon the memorial to Lady Jerningham, for Berwick-upon-Tweed.

It is intended to erect new premises to replace the present Stepney Temple, so well known to Wesleyans throughout the world. A central hall is to be built with seating accommodation for 2,169 persons, school-rooms are to be erected, and residences are to be provided for ministers. The total cost is estimated at £50,000.

One of the centre windows in the north aisle of Godmanchester Parish Church has been filled with stained glass, to the memory of the late Bishop McDougall, one of the former vicars of this parish. It is a three-light window, divided into two compartments, and the upper portion is symbolical of the work of the Bishop in foreign parts. The centre lights contain a figure of Christ, and the two side ones show groups of natives receiving Christian teaching. The three bottom lights represent the mission work of Paul and Barnabas.

A new room for the Congregation Sunday School has been opened at Shipdham, Norfolk. The building has been erected by Mr. Goss, of Shipdham, from plans of Mr. Whiting, of Dereham, the style of the adjoining chapel being copied.

At a meeting of the Berwick Town Council on Tuesday offers were accepted for the repair of several of the arches of the old bridge, which, it is stated, are being undermined, the work to cost £156. It was also agreed to repair the footpath on the bridge at a cost of £250.

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ILLUSTRATIONS.

PASSMORE EDWARDS SAULERS' PALACE, — GOVANHILL LIBRARY, GLASGOW.—SIXTEENTH CENTURY HALF-TIMBERED HOUSES, STRATFORD-ON-AVON.—DESIGNS FOR LIVERPOOL CATHEDRAL.—HOUSE AT WARRLINGHAM.—ST. MARGARET'S CHURCH, TOLL-CROSS, —EDINBURGH ARCHITECTURAL ASSOCIATION: FIRST PRIZE DESIGN FOR A SCHOOL OF ART.—THE VILLAGE CLUB, HOLMWOOD.—SKETCHES IN NORMANDY.—SHOP AND COTTAGE NEAR BOLTON.

Our Illustrations.

PASSMORE EDWARDS SAULERS' PALACE, LONDON, E. We to-day illustrate the principal entrance to "Jack's Palace," erected largely at the cost of Mr. J. Passmore Edwards. The cartoon for the carving was done by Mr. H. Wilson, the carver was Mr. M. Murphy, and the cast lead panels in the fronts were executed by Mr. Hunt, of Hoddesdon. Messrs. Niven and Wigglesworth were the architects. We illustrated a general view of the building in our pages for Jan. 3, 1902, when a description of the work appeared. The Palace was opened a few weeks since, and is now in use.

GOVANHILL LIBRARY, GLASGOW.

We publish to-day the plans of Govanhill Library, Glasgow, won in open competition in September last by Mr. J. R. Rhind, architect, Inverness. Mr. Horatio K. Bromhead, F.R.I.B.A., President of the Glasgow Institute of Architects, was the referee. On this occasion four libraries in different districts of Glasgow were competed for, and Mr. Rhind was successful in winning three of them. He was also successful in May last in the competition for the Dennistoun District Library in the same city. Dr. Andrew Carnegie gave £100,000 to Glasgow to build libraries, and as only about half that sum has been so far apportioned, there remains yet £50,000 to be expended in libraries in Glasgow.

SIXTEENTH-CENTURY HALF-TIMBERED HOUSES, STRATFORD-ON-AVON.

(For description and further sketches see p. 169.)

LIVERPOOL CATHEDRAL.

We have now, with this plate, given all the leading general drawings of Mr. Nicholson's design for this building, and we think it will be considered a very notable scheme in many ways. Like Mr. Tapper, we understand that Mr. Nicholson has worked under Mr. Bodley, and so carries out the traditions of a good school of Gothic design as realised for modern church architecture. Naturally the proposals of these gentlemen were likely to be considered worthy of recognition, and it may certainly be said that they realised what was anticipated in this respect. We illustrate Mr. Nicholson's elevation towards St. James's Mount; a section through the baptistery and nave; also two other sections—one of the choir and one across the lantern.

HOUSE AT WARRLINGHAM.

This house is erected on the southern slope of the range of hills overlooking Marden Park and the Woldingham Valley for Mr. A. L. Pike. The

chief feature of the plan is an oak-panelled sitting-hall, with heavy oak beams across the ceiling, and a large billiard-room adjoining, the principal rooms being designed to get the views of the surrounding country. The house has been erected by Mr. J. Quittenton, builder, of Warrlingham, from the designs of Mr. W. H. Harrison, F.R.I.B.A., of 66, Victoria-street, Westminster.

ST. MARGARET'S, TOLL-CROSS, NEAR GLASGOW.

The accommodation of this church is for 322. The cost is £2,203 exclusive of fees, but inclusive of all else. A local red sandstone is used inside and out; interior walls rough two-coat plaster and stone dressings. The roofs are white pine, and covered with Peck's tiles. The finishings are yellow pine; choir steps and pulpit of stone. The font is placed in the jamb of the choir, by request. The details of screens and stalls are exceedingly simple, and the pulpit is merely composed of two or three courses of ashlar enriched by a text. At a small outlay I tried to touch up the gasfittings and make them look interesting. That, with a few texts on the greenish stained woodwork in white, is all the decoration I had money for.

W. G. ROWAN, Architect.

EDINBURGH ARCHITECTURAL ASSOCIATION: FIRST PRIZE DESIGN FOR A SCHOOL OF ART.

The two plans and section, with the accompanying elevation, of a design for a School of Art won the first place in a students' competition recently, as above. Mr. John McIntyre, of Edinburgh, is the author. The drawings are so clearly shown that the design needs no further description.

COMPETITIONS.

BLACKPOOL.—The awards in the picture-poster competition were made last week by the Advertising Committee of Blackpool Corporation. Ninety-two designs were sent in from all parts of the world, and the committee awarded the four prizes as follows:—£100 to Messrs. Kiteat Brothers, of Hulme, and Wilson, London, for a picture of children building sand castles on the sea shore; £50 to Hans Deiter, of Dusseldorf, for an allegorical picture of three females representing Health, Pleasure, and Music floating over Blackpool; £30 to Robert Paton Brown, of Bradford, for a poster showing a gentleman and lady in holiday attire gazing at a distant view of Blackpool; and £20 for a picture view of Blackpool, by Messrs. Hargreaves and Wilson, of Blackpool.

FLAMBOROUGH.—The competition for the best scheme for the water supply of Flamborough has resulted in the plans of Messrs. Elliott and Brown, of Nottingham, being adopted. Fourteen schemes were submitted.

CHIPS.

On Wednesday week, the Bishop of Gloucester reopened the ancient parish church of Lower Guiting, Cheltenham, and dedicated the new work. The church contains some interesting Norman as well as later work. A sum of £2,600 has been raised, with which the work of repair was put in hand. This involved the rebuilding of the chancel (with the exception of the priest's doorway), the re-roofing of nave and transepts, and the construction of a vestry and organ-chamber. Various special gifts have been made, including a stone pulpit, a lectern, stained-glass windows, and altar furniture.

The Rochdale Unitarian church was reopened on Sunday after improvements. Messrs. W. H. Best's scheme of decoration was specially made as simple as possible in order not to take away from the richness of the windows and the carved work, which are the glory of the church. The walls are left severely plain, only a few bands being introduced to emphasise the architectural features.

Under its compulsory powers the London County Council has acquired The Rookery, Clapham Common, a small plot of land with an area of 9,460ft., with an old house and buildings, occupied for many years by a veterinary surgeon. The price to be paid is £5,100, being at the rate of over £23,500 per acre.

The International Society of Sculptors, Painters, and Gravers has been invited to arrange the British fine art section of the Dusseldorf International Exhibition, to be held in that city next year. The council has accepted the invitation, and Mr. A. Neven Du Mont has been appointed delegate by the Dusseldorf Exhibition directors, and also representative of the International Society.

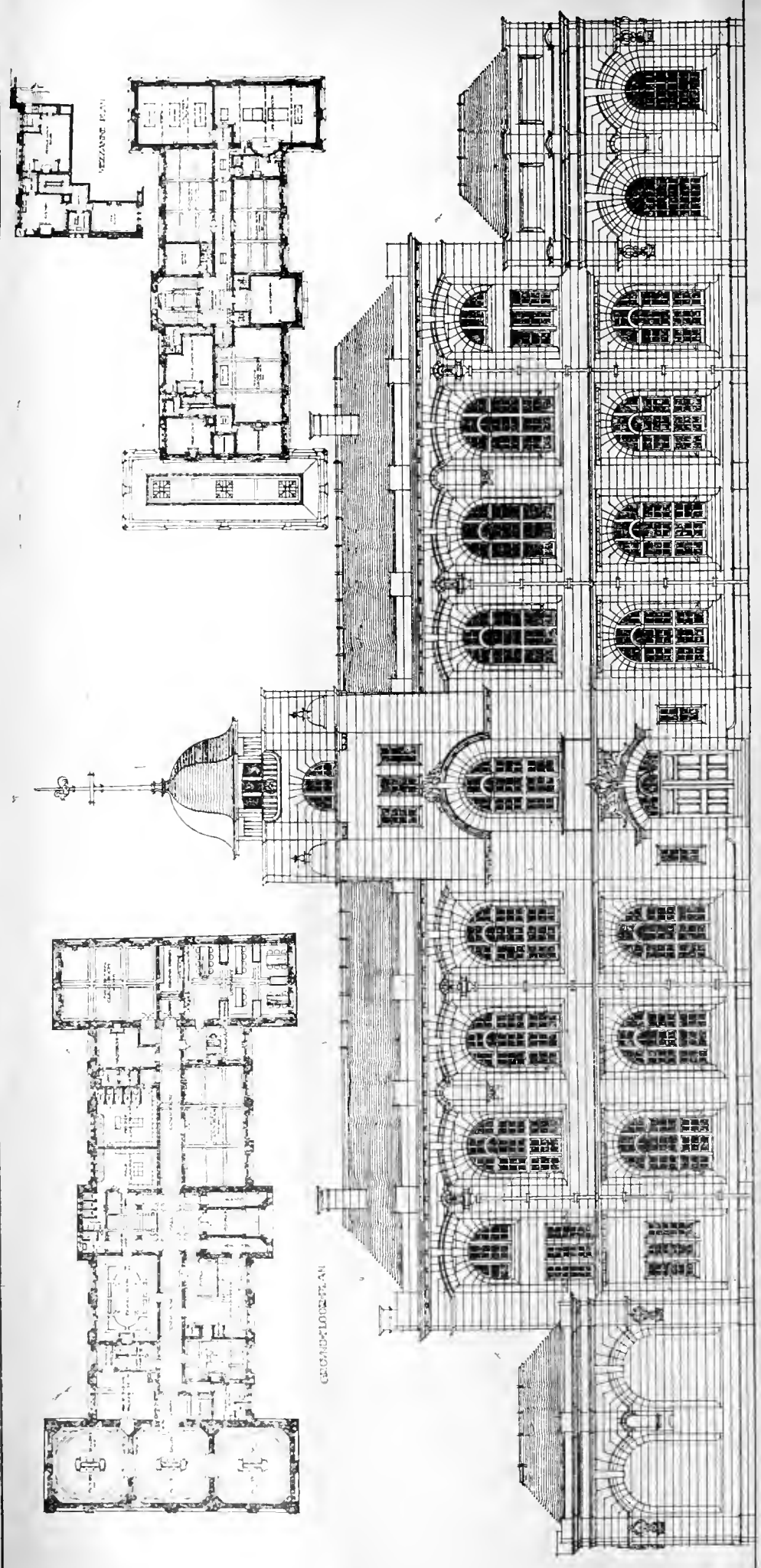
PROFESSIONAL AND TRADE SOCIETIES.

CHARD, SOMERSET.—The fifty-fifth annual meeting of the Somerset Archaeologists' Society was held at Chard last week, the proceedings commencing on Tuesday. The Very Rev. the Dean of Wells vacated the chair, and installed as his successor Mr. F. J. Fry, of Cricket St. Thomas. The President delivered an interesting address, in which he alluded to the antiquities of Rome and Egypt, and concluded with some local references, in which he said that Chard had many historical local references, those connected with Charles I., "King" Monmouth, and Charles II. Charles I. was twice in Chard, and the town had bitterly to rue the day when, in 1685, Monmouth marched through Chard, for did not Jeffreys hang some twelve or more of its citizens after the "bloody assize"? The members afterwards partook of luncheon in the Corn Exchange. At the conclusion a visit was made to the parish church, Grammar School, and the old manor, or court-house, on the Cornhill. In the afternoon the members proceeded to Membury, where there are the remains of an ancient British fortress, and from which other similar places of defence can be seen. The parish church of Membury was one of great antiquarian interest, and its features were explained by the rector, the Rev. F. E. W. Landon. At the evening meeting, a paper written by Sir Edward Fry, a vice-president of the society, was read by the Rev. W. Weaver, in Mr. Fry's absence, the subject being "Somerset, or Somersetshire," and a discussion followed. Mr. Weaver gave some interesting particulars of the town of Chard. On Wednesday the programme included a drive to Whitestanton, where members visited the church and the Manor House, the residence of Commander Elton, R.N., in the grounds of which there is a site for a Roman villa. From here the members went to Castle Neroche, and inspected the ancient British camp, where the owner, Viscount Portman, has recently allowed extensive excavations to be made with a view to arriving at the approximate date of its formation. Ilminster was reached about two o'clock, and after luncheon at the George Hotel a visit was paid to the parish church.

KENT ARCHEOLOGICAL SOCIETY.—The annual meeting of the Kent Archaeological Society was commenced on Monday week at Rochester. Earl Stanhope presided at the meeting and dinner. The customary evening meeting was held in the Corn Exchange, papers being read by Archdeacon Cheetham and Mr. G. Payne, the former dealing with "Archbishop William de Corbeil's connection with Rochester," and the latter with "The Archaeology of the Rochester District." The second day was devoted to a tour through the Hundred of Hoo, the places visited being Cliffe, Cooling, High Halstow, Stoke, and Hoo St. Werburgh.

MANCHESTER SOCIETY OF ARCHITECTS.—On Saturday, July 25, the members of this society visited Bournville, near Birmingham, Messrs. Cadbury's model village. Mr. W. A. Harvey, the architect, kindly met the party, and showed them over a considerable part of this most interesting estate. Several houses were examined throughout, and the nearly-completed Ruskin Hall was much admired. It was thought that the great success, both social and architectural, of this experiment should do much to encourage similar schemes elsewhere. The fine church of St. Agatha, Birmingham, was then visited under the guidance of Mr. Bidlake, the architect; and also Messrs. Keep's warehouse, a refined piece of work by the same architect. The day was concluded by a visit to the Eagle Insurance Co.'s offices (Messrs. Lethaby and Ball, architects), where the interior, with its beautiful marble and plaster work, was especially admired. Some of Mr. Edgar Wood's work at Middleton was visited on Tuesday evening, July 28, by 20 members. The Old-road Chapel has been lately decorated by the architect, and Mr. Jackson, the painter, and has a charming internal effect of rich colouring. The new Wesleyan chapel is an excellent piece of grouping, arranged picturesquely round a cloister or courtyard. Mr. Wood's own house is full of interest, and the formal garden he is developing shows what good results can be got on a very small scale.

A new drill hall was opened at West Bromwich on Saturday last. Mr. E. Wood is the architect, and the cost about £1,000.



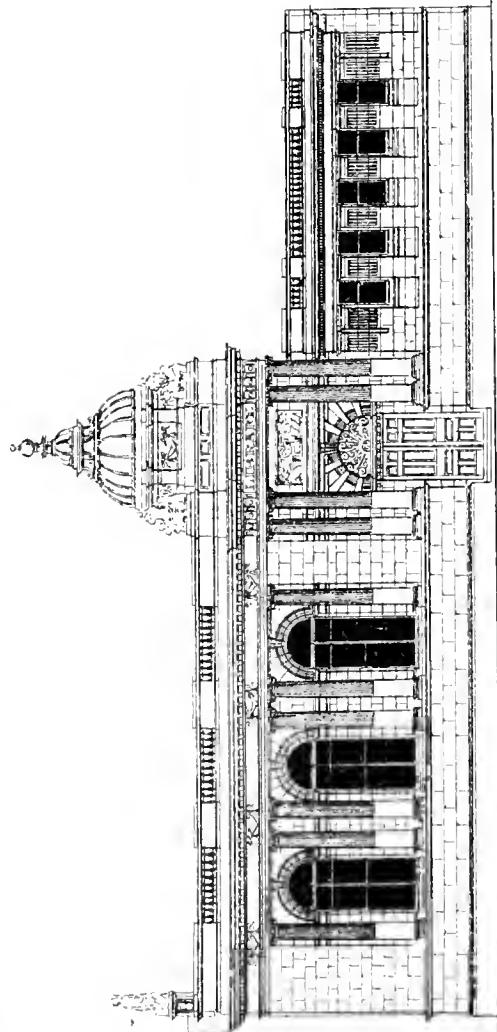
FRONT ELEVATION



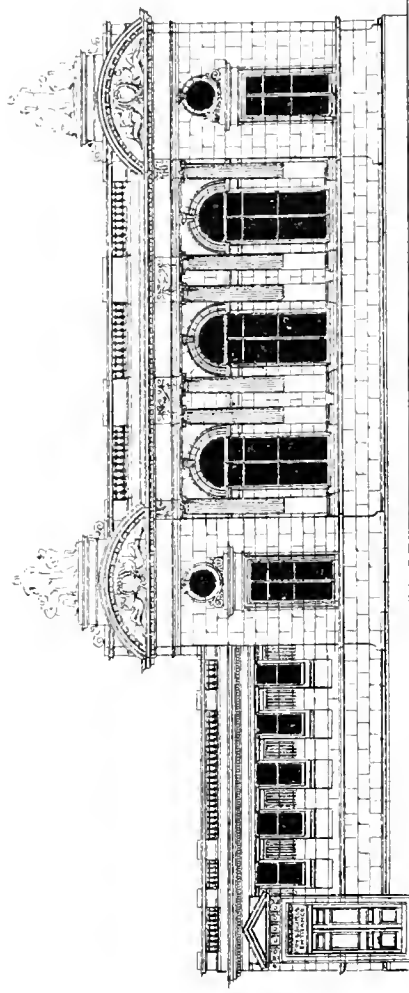
EDINBURGH
J. CORVACHAN



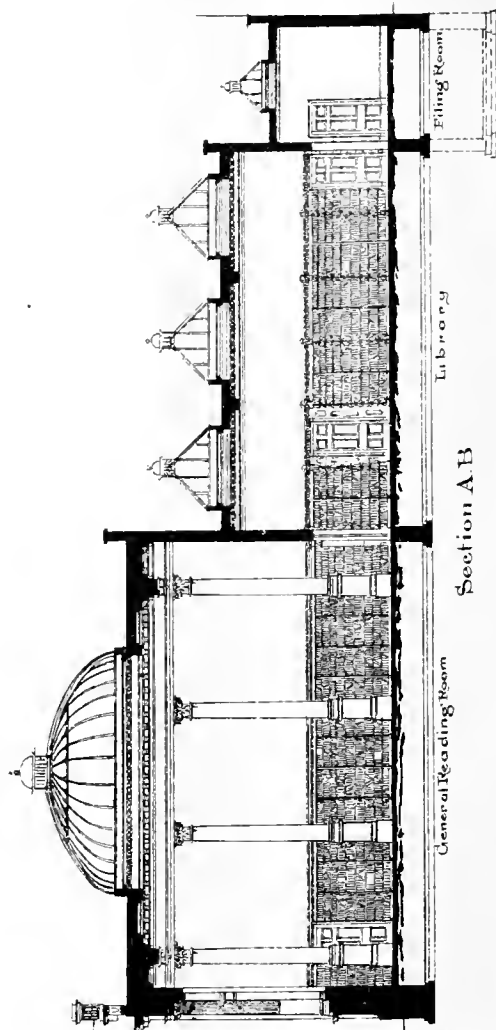
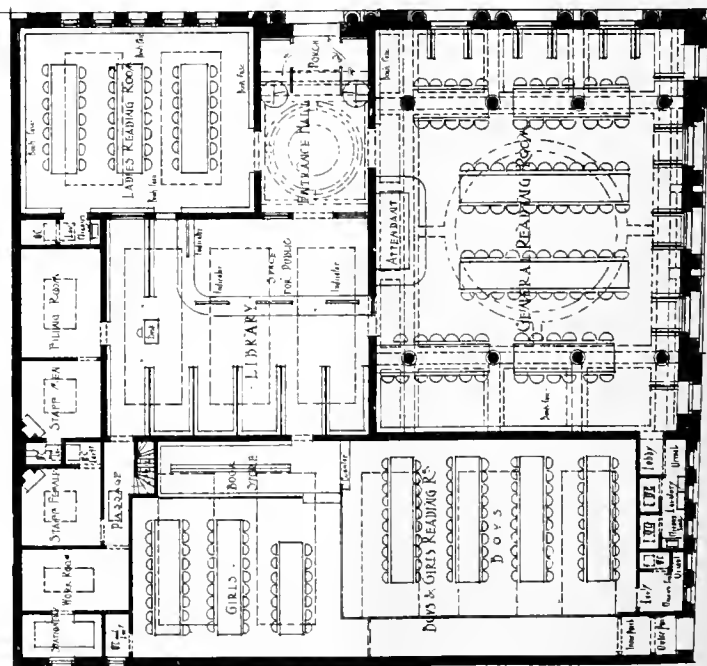
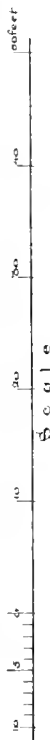
THE BUILDING BEGINS AUG. 7, 1903.



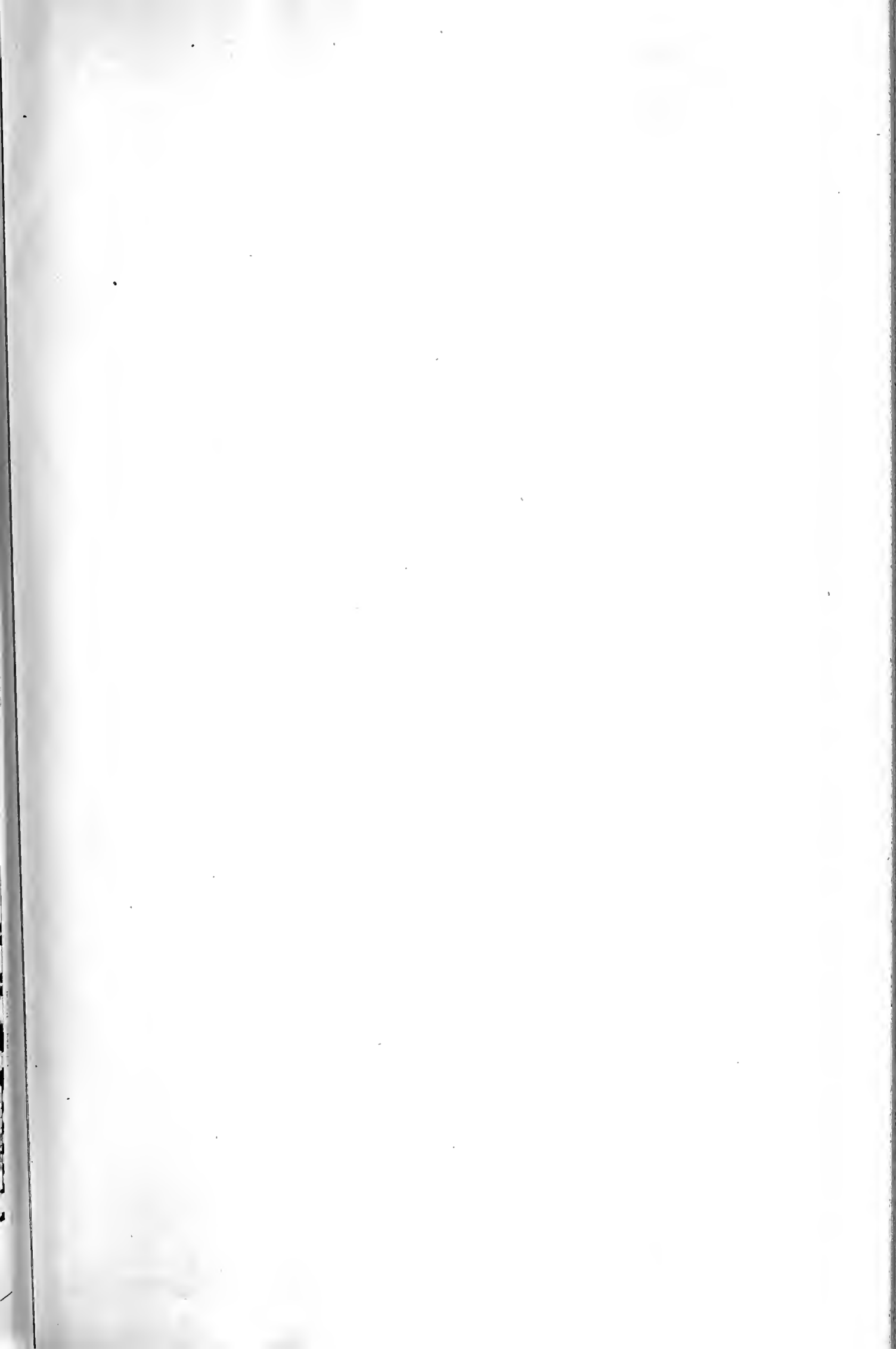
Elevation to Langside Road



Elevation to Calder Street

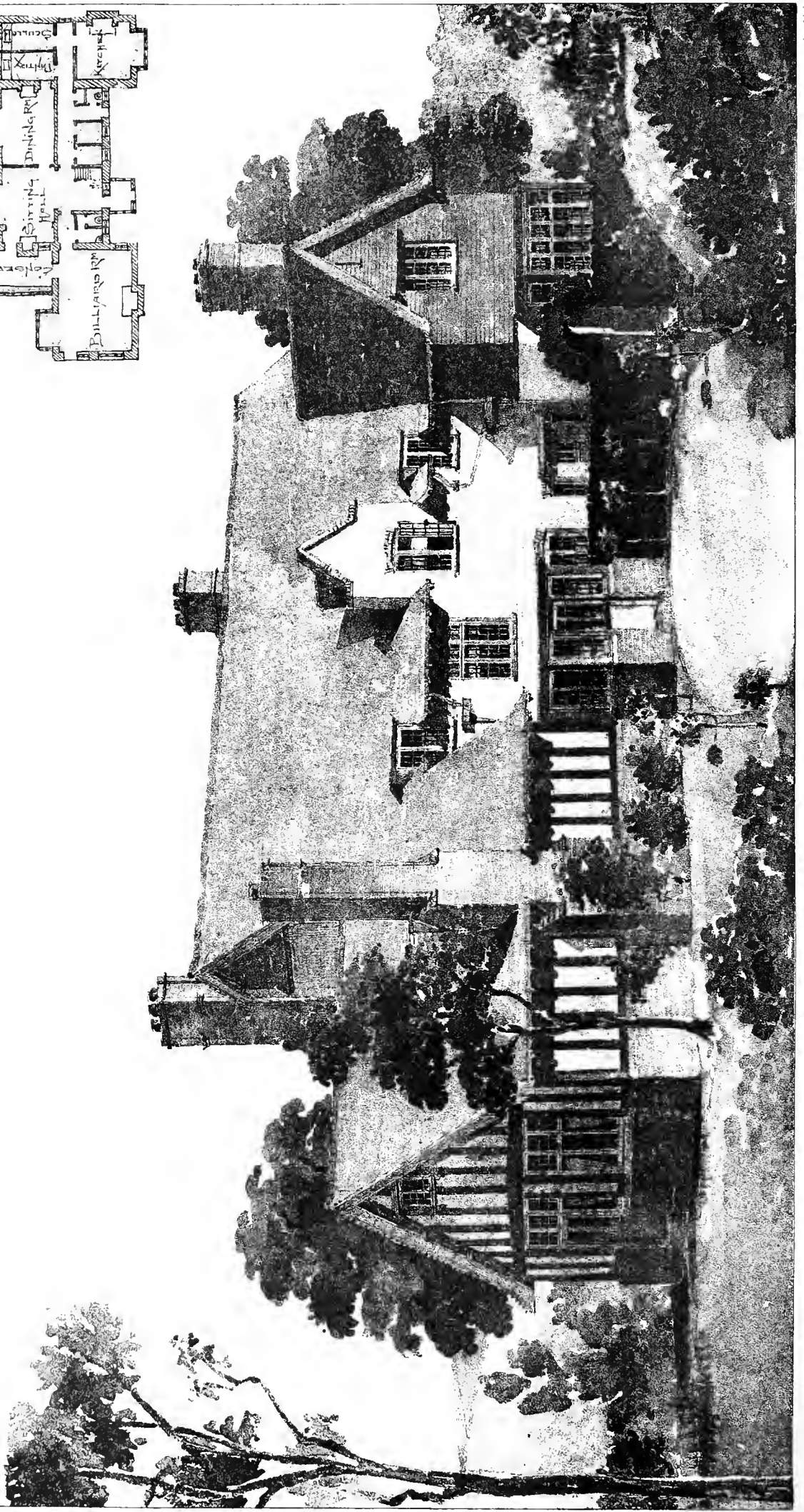
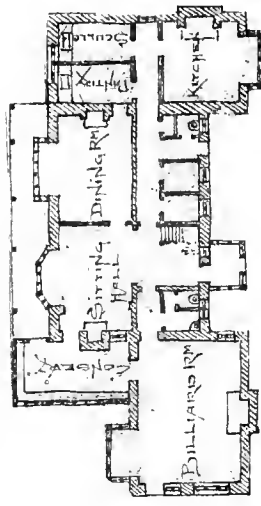


GOVANHILL LIBRARY GLASGOW. JAMES R. RHIND ARCHT.

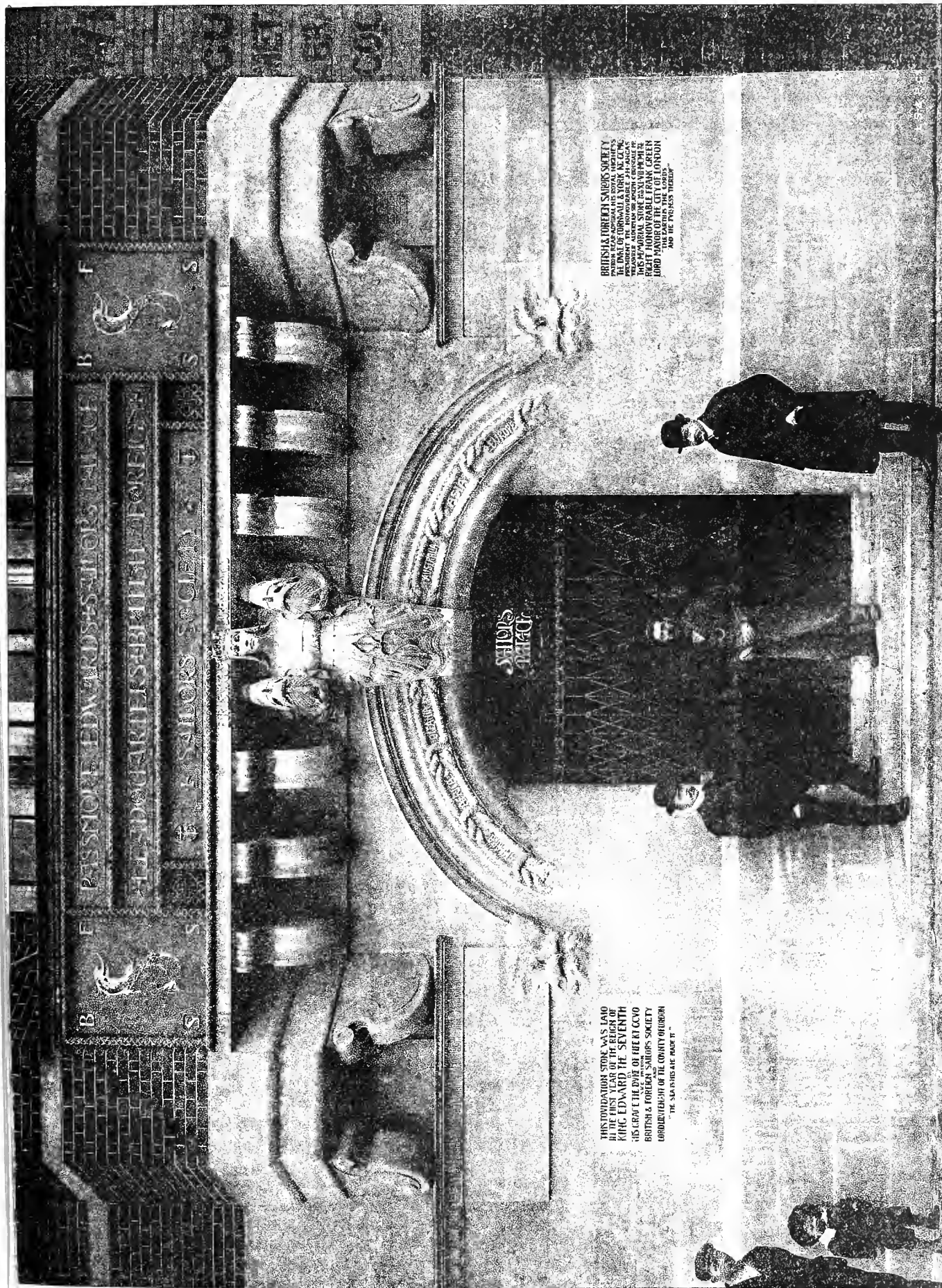


THE BUILDING NEWS, AUG. 7, 1903.

HOUSE AT WARLINGHAM • W H HARRISON ARCHT



"PHOTO TINT" BY JAMES AKERMAN, 11, QUEEN SQUARE, LONDON, W.C.

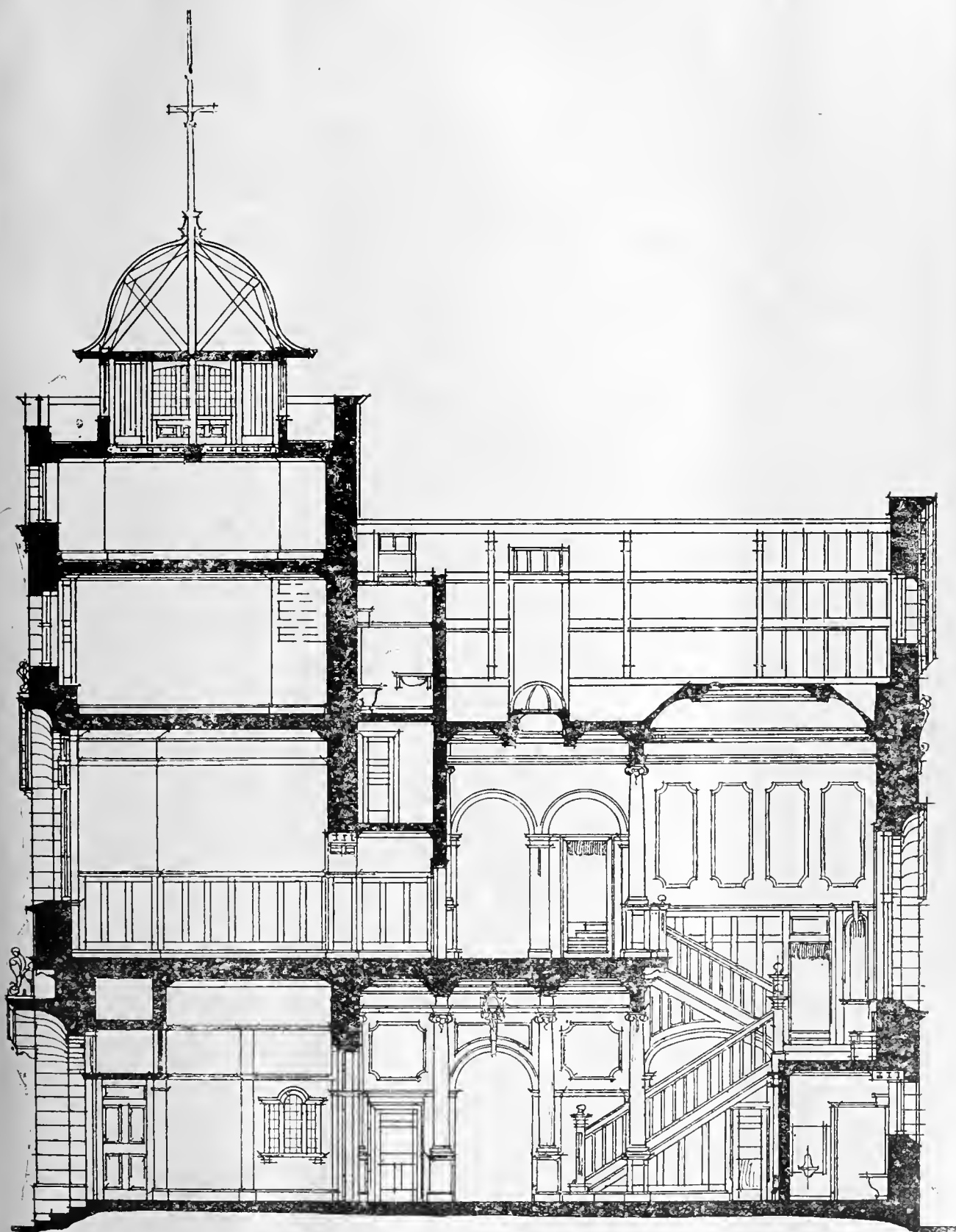


THIS FOUNDATION STONE WAS LAID
BY THE KING OF THE BURGUNDY
KING EDWARD THE SEVENTH
HIS GREAT LIEGE OF THE KING
BRITISH & FOREIGN SAILORS SOCIETY
CONSEQUENT OF THE COUNTY OF LONDON
"THE SEA ENTERS ARE MADE IT"

BRITISH & FOREIGN SAILORS SOCIETY
PRESIDENT THE HONORABLE JAMES GREEN
THE EARL OF DONOUGH & LORD ALLENBY
THIS FOUNDATION STONE WAS LAID BY
RIGHT HONORABLE FRANK GREEN
LORD MAYOR OF THE CITY OF LONDON
AND THE PRINCES THEREOF

PHOTO TINT

PASSMORE EDWARDS SAILORS PALACE. PRINCIPAL ENTRANCE. NIVEN & WIGGLESWORTH, ARCHITECTS



EDINBURGH ARCHITECTURAL ASSOCIATION COMIETITION.
(Section through Entrance Hall.)

LEGAL INTELLIGENCE.

A DEBTOR WITH A SURPLUS.—At Stockton Bankruptcy-court, John Cooper, plasterer and builders' merchant, of Stockton, appeared last week for his first public examination. He said his liabilities were £1,601, and he did not know until after he filed his petition that there was a surplus of £1,049 4s. 6d. He owed to unsecured creditors £300, and his estate was worth £1,350. He was overdrawn at the bank to the amount of £1,298 17s. 7d., for which the bank held deeds of property valued at £2,100 as security. The examination was adjourned.

MORE SLANDER AT TAMWORTH.—DISTRICT SURVEYOR SUES DEPUTY MAYOR.—At the Birmingham Assizes last week, before Mr. Justice Ridley, an action was heard, brought by Henry John Clarkson, surveyor of the Tamworth Rural District Council (formerly borough surveyor), against Frederick George Allton, provision dealer, Deputy-Mayor of Tamworth, and a member of the rural district council, for slander. Mr. Hugo Young, K.C., and Mr. H. H. McCardie (instructed by Mr. Barnes, Lichfield) appeared for plaintiff; and Mr. R. H. Amphlett, K.C., and Mr. F. W. Sherwood (instructed by Mr. Watson) for the defendant. In his opening statement, Mr. Hugo Young stated that the necessity for these continued actions was the existence of a clique headed by Mr. Alldritt, the present Mayor, which had for some years persistently persecuted Mr. Clarkson, and alleged all sorts of things against him. Out of previous actions the plaintiff had always come victorious, and on each occasion the jury had said there was no justification for the attacks made upon him, which had made his life at Tamworth a regular burden. Mr. Hugo Young traced at some length the formation of the Ratepayers' Association at Tamworth, the head of which was Mr. Alldritt, with the defendant, his lieutenant and henchman. The object of this association, he said, was to return to the town council adherents of Mr. Alldritt, and so get a majority for this gentleman. Mr. Alldritt and his friends were successful at the 1901 November election, and one of the first actions of the council was to give Mr. Clarkson three months' notice terminating his engagement. The first of two slanders complained of on the present occasion was alleged to have been spoken at a complimentary dinner given to Mr. Alldritt on January 15, 1902, to celebrate the success of the Ratepayers' Association. Counsel read from the local Press lengthy extracts from a speech made on that occasion by Mr. Alldritt, a master, as Mr. Young suggested, of violent language. One of the statements used was—"We have managed to get rid of the services of one of the most undesirable officials it was ever the lot of any municipality to possess." Later Mr. Alldritt said: "On November 1 last whoever can remember a more scandalous proceeding than the borough surveyor of this town, and actually members of his own family party, himself using his skilful lying tongue to depreciate and defame honest men who were trying to get into the council. He was bribing the community in every direction." For these and other slanders, counsel went on to say, Mr. Clarkson brought an action in which Mr. Alldritt pleaded that the statements were true, and brought no fewer than 51 charges of misconduct. All these were thoroughly sifted, and Mr. Alldritt was ordered to pay £100 damages. On Oct. 22, 1902, at another complimentary dinner to Mr. Alldritt, the latter made another speech in which the following sentences occurred:—"If he (Mr. Alldritt) had not been more guarded in regard to certain matters which had been made known to him only in a degree which was yet insufficient to bring them thoroughly home, he could have proved to them that anything he had yet said only touched the fringe of the most abominable life (meaning, it was contended, the life of the plaintiff) that was ever connected with any municipality in the world. If they could only get an investigation into the various books of the different public bodies in the neighbourhood, a state of things would be revealed which, to use a Krugerian phrase, would absolutely stagger humanity." At that meeting the defendant was present, and called out "It is true!"—thereby adopting, as Mr. Hugo Young contended, all the slanders uttered by Mr. Alldritt. For these slanders the Mayor himself was sued at the last Assizes, and agreed to pay a further £100 damages. An injunction was also granted restraining him from repeating the statements. The second slander was alleged to have been spoken at a meeting of the rural district council on December 20, 1902, in which the defendant referred to an account paid to Mr. J. Morris, of Hurley, of £5 18s. on November 15, 1899, in which beer supplied to workmen was charged as bricks and mortar and was initiated by the surveyor. The explanation of this, said counsel, was that a number of men employed on sewage works declined to continue working unless they had beer, and by Mr. Clarkson's instructions it was supplied by Mr. Morris, who also supplied bricks. A difficulty arose as to whether the account for beer would pass the auditor, and on the suggestion of a clerk Morris made out another account in which the amount due was all charged as bricks. This account, with others, was put before Mr. Clarkson, who, no doubt under the

impression that it had been checked by his clerk, initialled it. This matter was thoroughly threshed out at the hearing of the last action, yet the defendant, knowing Mr. Clarkson's explanation and that he had been acquitted of anything dishonourable, although it might have been irregular, made the charge again in a way to create a wrong impression. Defendant had also made certain improper suggestions against Mr. Clarkson in relation to his performance of certain work on behalf of the trustees of the Shuttington School. After evidence, and the reply of defendant's counsel, his Lordship having summed up, the jury found, in regard to the first slander, a verdict for the plaintiff for £10. The foreman stated that in reference to the second slander, the majority of the jury were of opinion that it was not malicious, and therefore privileged. The question of costs then formed the subject of argument. Mr. Amphlett contended that on the finding he was entitled to the second issue, and therefore at least to a portion of the costs. This matter was, however, reserved for further argument. Mr. McCardie applied for an injunction restraining the defendant from repeating the statements; but on the defendant giving an undertaking not to utter them again, his Lordship expressed the opinion that this would meet the requirements of the case. Mr. Amphlett asked his Lordship to stay execution in view of the possibility of appeal, but the application was declined. Mr. Justice Ridley observing: "There has been quite enough slander from Tamworth, and I hope to put an end to all this litigation. I shall not give you any stay, in the hope that this will end the whole matter. There is plenty of room for municipal life and enterprise without scandal."

BUILDING BY-LAWS.—Robert Harbottle, builder, was summoned at the Most Hall Police-court last Saturday on a charge of having contravened the by-laws of the Walker Urban District Council. Mr. Newlands, who prosecuted, said the defendant presented plans some time ago of an intended new building, and in the notice which accompanied these plans he stated that the external, party, and cross walls would be 14in. and 9in. thick. He proceeded with his building, and at the time he commenced there was already on each side of the site an existing building, the gable walls of which he intended to use. These walls were 9in., and they were a certain height. Defendant, however, determined to carry his building higher than the adjoining building, and, in order to do that, he ought to have continued the 9in. wall on each side at the same thickness. What he did instead was to carry up the new part of these walls at a thickness of 4½in. instead of 9in. In January last, proceedings were taken against him in that Court, and the justices then dealt with the case. He was then fined, and the understanding was that he would put it right by an arrangement with the adjoining owner. But, instead of doing that, he had built against it another 4½in. wall, and had supported it by a batten resting at one side against a flue. The offences against the by-laws were that this wall had not a proper "footing," and that "bond" timber had been used in the wall. The by-laws were for the purpose of insuring safety, and he would call evidence to show that the building in its present condition was unsafe. Evidence was given by Mr. T. W. Lycock and Mr. J. P. Spencer. On the suggestion of the Chairman (Mr. Wigham Richardson) it was agreed between the parties that the case should stand adjourned for two months, to allow of the defendant putting an iron girder on the level of the old wall. It was agreed in that event that, if the work was satisfactory, the summonses would be withdrawn, each side paying their own costs. The Chairman accepted the task of seeing the work was done satisfactorily, and intimated to the defendant that he had chosen a very particular inspector.

A WALL AND A QUESTION OF RIGHT.—John Lockwood, Underbank, Holmfirth, brought an action at Leeds Assizes, on Tuesday, to claim £95 8s. damages for breach of agreement and trespass from the West Riding County Council and others. Mr. Waugh appeared for the plaintiff, and Mr. J. A. Compston represented the defendants. The case was tried without a jury. It was stated by Mr. Waugh that plaintiff was owner in fee of certain premises, consisting of two houses, in the Dunford-road. The premises were erected 60 years ago, and in their construction use had been made of the wall of the main road for support. This wall had got out of repair, and the county council had pulled down part of the plaintiff's property in order to make it good. The view taken by the county council was that plaintiff was responsible for the repair of the retaining wall. The wall in question had been pulled down and set back about 4ft. Mr. Justice Phillimore assumed up the situation by saying that plaintiff had consented to the county council pulling down the house abutting on the wall on the council agreeing to rebuild without expense to the plaintiff. The building was pulled down, when a third party, the district council, stepped in, and claimed the right to interfere with the frontage, and upon that the county council refused to rebuild until

plaintiff had settled with the district council. Now the county council could not throw up their agreement without the plaintiff's consent, or the existence of some law rendering it illegal for them to carry out such agreement. His Lordship held that plaintiff had not released the defendants, and that the county council had failed to show that the district council possessed powers preventing them from carrying out their agreement. His Lordship then heard evidence on the question of damages. Judgment for £75 8s., with costs, was ultimately given. Mr. Compston asked for a stay of execution, as it was an important case for his clients, who might take it to another court. This was granted under terms.

CHIPS.

The church of St. Mary, Black Torrington, was reopened on Thursday week after restoration. The church is an ancient one, dating from the latter half of the 14th century, and was originally cruciform, but later alterations and additions have effaced this feature, and the present tower, built in the 16th century, stands at the west end of the nave. Among other "finds" during the progress of the work was that of the parish stocks, which were discovered hidden away in the roof. The funds raised for the work amounted to £1,333, and an additional £500 is required.

The building committee of the Rochdale Corporation have, during the past month, approved plans for the erection of nearly 250 new houses in the borough. Of these 195 are to be built at Deepdish. A joint conference of representatives from the building, waterworks, and health committees is to consider the type of water-closet to be adopted in the borough. The Local Government Board have intimated their sanction to the borrowing of £2,350 and £650 for the extension of the sewage disposal works at Trub, Castleton Moor.

The Bishop of Salisbury reopened Ramsbury Church on July 27, on completion of its restoration at a total cost of £7,000 to £8,000, the last portion being some oak benches costing about £1,000. The church is an ancient one, and the work of restoration has been spread over about thirteen years.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied the patent warm air ventilating Manchester grates to the Clifton-street Schools, Swindon.

Exhaustive tests seem to show that sulphate of aluminium is one of the best fireproofing substances for wood, as it checks combustion by forming an infusible and non-conducting coating, while such substances as ammonium sulphate or ammonium phosphate when heated check combustion by emitting an incombustible gas.

The foundation-stone of a new Sunday-school building for the Congregational body at Teignmouth was laid last week. Mr. J. J. Hayman is the contractor, and he will work from the designs of Messrs. Bridgman and Bridgman, of Torquay and Paignton. The building is to consist of a main hall, 26ft. by 3½ft., and six large classrooms, affording accommodation for some 400 children.

At the meeting of the Wolverhampton Board of Guardians last Friday it was stated that the fees paid to Mr. Marshall, of Nottingham, the architect for the new workhouse, have been: As architect £6,585, and as quantity surveyor £1,656; total £8,241.

The Westminster City Council have adopted a recommendation of the Improvements Committee to contribute £40,000 towards the cost of widening Piccadilly from Sackville-street to Piccadilly-circus, which the County Council decided to undertake at its last meeting, as reported last week, subject to the Council contributing a fifth of the cost. An amendment in favour of contributing £20,000 was lost.

The extension of Glasgow University buildings is likely to cost about £90,000. Estimates amounting to £67,000 have been accepted; but these are exclusive of the internal fittings and furnishings of the new buildings, which, it is expected, will probably entail a further expenditure of £20,000.

The inhabitants of Ropley, Hants, are placing a new clock with two large dials, from the design and plans of Lord Grimthorpe, in the tower of their parish church, and striking hours on large bell. Messrs. Wm. Potts and Sons, clock manufacturers, Leeds, have the work well in hand. They are also making a large clock for the parish church, Kirkby-in-Furness, Lancs, for Mrs. Todd-Newcomb in the memory of the late Mr. Todd-Newcomb, which will show the time on large bronze dials and strike the hours on large bell, from Lord Grimthorpe's designs and plans.

The Manchester City Council on Wednesday last approved the sale of the old town-hall site in the centre of the city. The site contains about 1,500 square yards of land, and it was bought by Messrs. Charles Heathcote and Sons, architects, at £110 a yard for a banking company.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—B. R.—Bodanza.—W. R. and Co.—M. J. R.—W. Condor.—S. B. W.—J. Manners.

Correspondence.

PUBLIC LIBRARY, BROMLEY, E.

To the Editor of the BUILDING NEWS.

Sir,—The Competition Reform Committee approves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reason: No independent assessor.

Architects are requested to abstain from competing unless they receive a further communication to the effect that the conditions have been satisfactorily revised.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

10, Gray's Inn-square, London, W.C., Aug. 1.

COMPETITION FOR PROPOSED SCHOOL, NEW BROMPTON.

Sir,—The committee of the Competition Reform Society disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: No independent assessor.

Readers are requested to abstain from com-

peting unless they receive a further communication to the effect that the conditions have been satisfactorily revised.

N.B.—Members are requested to send to the Hon. Sec. particulars of any open competition which may from time to time come to their notice, and which may not have been advertised in the building papers.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

10, Gray's Inn Square, London, W.C., Aug. 4.

ALL HALLOWS', EXETER.

Sir,—Mr. Read, of Exeter, whose Christian name happens to be the patronymic of a prominent West-country architect, can easily blame other people if, in so doing, he sometimes causes trifling confusion.

Still, the fact remains that Mr. Edward Hall-Harbotte, F.R.I.B.A., of this city, and of Bridge Hill, Topsham, worthily holds the appointment here of Cathedral and Diocesan Architect and Surveyor. As a matter of fact, he not only is so now, but did so years before Mr. Harbotte Read (with or without the "E") had ever been heard of in these parts.—I am, &c.,

Exeter, Aug. 1.

EXON.

Intercommunication.

REPLIES.

[11995].—Tree and Foundations.—None, I should say; lateral roots being cut off. There are thousands of dwellings under similar circumstances all about—REGENCY PARK.

CHIPS.

The Newcastle-under-Lyme Town Council last week resolved that Mr. Wilcox's estimates for the amended scheme for the sewage disposal works, amounting to £20,325, be approved and adopted, and that the town clerk be instructed to make an amended application to the Local Government Board for their sanction to the borrowing of the sum of £25,800, being the estimated cost of the proposed works.

A new ambulance station has been opened at Ipswich. The builder was Mr. G. B. Berry, 311, Woodbridge-road. There is a spacious drill-room, 41ft. by 33ft., and an adjoining classroom, 25ft. by 33ft. The larger building is a corrugated iron building, matchboarded inside, and supported by iron principals, designed by Messrs. Cocksedge and Co. There are the necessary lavatories, &c., and at the back is a good drill-ground, about 150ft. by 25ft.

Last week the Bishop of the diocese reopened the parish church of Lower Guiting, near Cheltenham, and dedicated the restoration work which has been recently carried out, and a combined vestry and organ chamber which has been added at an outlay of about £2,600. The whole of the chancel, with the exception of the priests' doorway, has been taken down and rebuilt, and the nave and transepts have received new roofs and been otherwise renovated, while a vestry and organ chamber have been built over the heating chamber.

Adjoining the hotel at Shirley, Hants, a commodious hall has been erected, with seating accommodation for nearly 400 people, adapted to the purposes of a concert, public meeting, or dinner. Designed by Mr. A. A. Burnett, F.S.I., the building has been constructed by Mr. Henry Cawte, of Shirley. The hall is 36ft. wide by 53½ long, with stage, two dressing-rooms, ladies' and gentlemen's cloak-rooms, vestibule, and refreshment-room.

The Ramsgate Royal Sailors' Rest and Bethel will be completed about October next. The entire cost will be some £8,000, towards which £3,700 has, within some fifteen months, already been given and promised.

The construction of the long-talked-of Tenterden Railway has commenced. A considerable quantity of fencing has been done, and contractors' rails have been laid. The railway will bring the place in direct communication with Tenterden, Robertsbridge, and Hastings.

Lord Balfour of Burleigh will perform the ceremony of laying the memorial-stone of the technical school now being erected through the efforts of the Duchess of Sutherland at Drummie, near Golspie, on Tuesday, September 8.

Cornell University has established an alternative course in architecture leading to the degree of Bachelor of Architecture, from which physics, chemistry, geology and botany, and the higher mathematics are excluded, the change being made in pursuance of the belief of the trustees that some students will receive greater benefit from devoting the time thus saved to practice in design than in application to uncongenial science.

Our Office Table.

THE Public Buildings Bill, now before the House of Commons, authorises the issue out of the Consolidated Fund of £1,790,000 towards the cost of the Government offices now being erected at Westminster. The construction of the buildings has already been sanctioned by the Legislature, and the intention is to raise the money as the work proceeds. The building at Westminster will be bounded on its four sides by Charles-street, Parliament-street, Great George-street, and St. James's Park, the frontage in Great George-street being 700ft. and that in Whitehall about 320ft. Practically its dimensions will be identical with those of the block in which the Foreign Office, Colonial Office, India Office, Home Office, and Local Government Board are located. Accommodation will be provided at the new site for the Local Government Board, the Board of Trade, the Board of Agriculture, Board of Education, and some other departments. The Bill includes £800,000 for land in Great George-street, including that upon which the Institution of Civil Engineers stands. Another item is one of £10,000 for the purchase of No. 5, Old Palace-yard, the residence of Mr. Labouchere.

THE last day of the Royal Academy for the current year attracted the usual crowd of holiday-seekers on Monday. Sales for the season have been well up to the average of recent years, a large number of the smaller canvases having found a market at easy prices. A fair proportion of the larger and more costly pictures have been sold, the list being headed by Mr. C. Napier Hemy's yachting study entitled "Youth," which has fetched the sum of £1,260. Sir E. A. Waterhouse's landscape, "Warkworth Castle, Northumberland," has been sold at £800; and Mr. John Charlton's battle picture of the "Charge at Rossbach" has brought £525. Sir E. J. Poynter's "Cave of the Storm Nymphs," and Mr. Joseph Farquharson's charming snow scene "The Shortening Winter's Day is Near a Close," have both been sold, but the price in each case has not transpired. Mr. Orchardson's study in portraiture, "Other Days," has been sold at £150, and the popular picture of Alain Chartier, the poet, receiving a kiss while asleep from Margaret of Scotland, in the presence of her attendants, has been disposed of at £600. The "Wonders of the Deep," by John R. Reid, has been sold at £84, and E. W. Waite has sold his "Autumn in her Weeds of Yellows" at £262 10s. and his "Now Autumn's Fire Burns Slowly Along the Woods" at the same price. Mr. W. Frank Calderon's "Lot 97, a Grey Mare," has brought the round sum of £500, and "Faith," by C. E. Perugini, £400. The two most popular canvases of the year have evidently been purchased by the Chantrey Bequest—viz., Mr. David Murray's "In the Country of Constable," which fetched £630, and "Autumn in the Mountains," by Mr. Adrian Stokes, for which the sum of £300 has been given.

THE Coal-smoke Abatement Society, which in 1901 organised a series of tests in order to ascertain which open grates were best adapted for the prevention of smoke, has received a report from the jury of experts nominated by the society, who have recently been conducting a further series of tests in connection with the Lighting and Heating Exhibition at the Crystal Palace early in the year. Of the grates entered for competition at that show, five were selected by the jurors as being in theory nearest the ideal, in order to undergo an exhaustive series of practical tests in a building specially placed at the disposal of the society by his Majesty's Office of Works. The result of the experts' investigations and experiments is that Messrs. Chavasse and Kerr, of Birmingham, have been awarded a certificate by the society for their grate, known as the "Tropicana," which came out first among those tested for heating purposes, diminution of smoke, and economy of fuel used. The object of the society in arranging these tests is to secure, if possible, the production of a grate which, in burning the ordinary household coal, will consume its own smoke.

THE report of the Select Committee on the Ventilation of the House of Commons was issued last Friday. The committee investigated the condition of the air in the chamber, and found it to be purer than was found in many similar buildings. The conclusion, however, was not confirmed by the subjective test of the members'

own feelings, who complained of lassitude and feelings of heaviness after a lengthy stay in the House. The committee, besides making certain recommendations on the present system of ventilation, recommend the appointment of a sanitary officer to superintend the ventilation of the House, the placing of the whole of the cleaning arrangements under one authority, and the more frequent removal, for cleaning purposes, of the open-work matting on the floor which covers the air entrance under the present system. The committee believe that particles of dirt and other impurities must be borne into the chamber by the air passing through this matting.

The Public Buildings Expenses Bill contains an item which illustrates the decline in the value of public securities. By the Public Buildings Expenses Act of 1898, £2,550,000 was appropriated for the construction of public buildings; but as the expenditure of the money must be spread over several years the bulk of it was invested in Consols. The Bill now before the House contains an item of £80,000 to make good the depreciation in the value of the money invested since the year 1898. The original estimate for the buildings sanctioned has also been exceeded by £500,000, and for this sum a vote is also taken.

The members of the Bridge House Estates Committee met last Friday at the Guildhall, under the presidency of Mr. Deputy Pryke, the chairman, to sign a report in favour of a scheme for rebuilding Southwark Bridge at a cost of nearly £350,000. It is proposed to lower the crown of the structure by 7ft., a work which will in no way impede the navigation on the river, while it will reduce to a very large extent the excessive gradient on the City side. It is owing to the steep gradient on the City side that Southwark Bridge has of late years been avoided by the drivers of heavy vehicles. A proposal from the County Council to run an electric tramway over the bridge into the City is also under the consideration of the Bridge House Estates Committee.

An amalgamation has been made between Messrs. Measures Brothers, Ltd., of 53a, Southwark-street, S.E., and H. and G. Measures, of Croydon. The purchase price agreed for the goodwill, plant, tools, and stock works out roughly at £43,000, of which £20,000 is to be paid in cash and the balance in ordinary shares. This includes plant and stock of Messrs. H. and G. Measures at Battersea, where there is a building site with a frontage to the river, which Messrs. Measures Brothers propose to lease for fourteen years with the option of purchase of the freehold during the first seven years. Messrs. Measures Brothers have secured the opposition business for about one-ninth of their total capitalisation; so that about 85 per cent. of the amount paid or to be paid to H. and G. Measures for the whole of their business is in available and tangible assets.

The effect of automobiles on roads is attracting considerable attention here, where there is an opinion gaining ground that the large pneumatic tires passing rapidly over the surface suck the binder from the interstices of the stone. The *Engineering Record* has been investigating this subject, and has failed so far to find among American road experts any confirmation of this foreign view. The only engineer who has noticed any effect which might be due to this cause is Mr. Louis L. Tribus, commissioner of public works of Richmond borough, New York, who writes: "While we have noticed some of the suction action mentioned, we have not as yet discovered that any serious damage has been done—that is, to be able to charge it particularly to the rubber tires of automobiles." Mr. Henry Manley, assistant engineer in the Boston Engineering Department, believes that "the rapid currents of air created by the broad wheels, independent of any suction, might produce the effect noted." Mr. Henry I. Budd, State commissioner of public roads of New Jersey, and Mr. Wm. Pierson Judson, deputy state engineer of New York, doubt if automobiles have any tendency to ravel macadam. Mr. G. A. Roullier, of Flushing, N.Y., believes that the tires of these vehicles may cause trouble when they become sufficiently numerous. "If, in certain sections, the extent of this suction becomes so great as to cause inconvenience," he writes, "the binding material might be mixed with a certain amount of limestone, so as to consolidate it as much as possible. At this writing I have in mind a piece of limestone road which is well travelled by automobiles, and I am aware that there is no raveling on that. It is perfectly

certain that no plain or ordinary binding material having no adhesive qualities of its own will resist the sucking action mentioned."

The site proposed to be acquired by the Garden City Pioneer Company, Limited, for their first enterprise is near Mitchin, on the Great Northern Railway. The estate, which is 4,000 acres in extent, can be reached from London in about an hour; it will furnish an abundant water supply, and it is for the most part 250ft. to 300ft. above the sea level. Upwards of £40,000 has already been promised towards the special fund of £50,000 which is being raised in order to enable negotiations to be completed, amongst the amounts subscribed being £20,000 by Mr. J. P. Thomasson (Bolton), £10,000 by Mr. George Cadbury and family; £2,000 each by Mr. Ralph Neville, K.C., and Mr. H. W. Lever; and £1,000 each by Mr. Aneurin Williams, Mr. H. D. Pearsall, and Dr. R. O. Moon.

The new *Times* building, in New York, offers some novel problems in construction. It is to be not only some twenty stories high above the street, but is to have three stories underground, the floor of the press-room being 55ft. below the curb. In addition to this, the city subway is to run through it, 22ft. below the curb; so that the press-room and composing-rooms will have a railroad above them. This feature is, however, regarded as advantageous, on account of the facilities which the subway will afford for distributing the various editions of the paper. Ventilation for the basement stories is to be secured by means of a shaft for supplying fresh air, while foul air is exhausted by a shaft, through the middle of which runs the main smoke-stack.

ARIOCH WENTWORTH, a retired marble manufacturer, a millionaire, and one of the largest estate owners in Boston, U.S.A., is dead at the age of ninety years. He began work in a granite yard, but left this to enter a soapstone factory, which he afterwards purchased. He afterwards took up the marble business, employing as many as 300 men upon all kinds of imported and domestic marbles. He was a great traveller, and had visited nearly every part of the globe. Arioch was one of the most venerable masons we remember hearing of. 'Tis said the reason no really old stonemasons are ever seen in London is that, when they reach their 40's, they become donkeys on Blackheath!

PETERBOROUGH, according to the *Birmingham Daily Post*, makes enough bricks in the course of a year to put a girdle four times round the earth. It is estimated that the busy brickmaking yards, which have grown up in great number round the ancient city in the last twenty years, turn out 800,000,000 bricks annually. As the length of a brick is about 8in., then, if Peterborough's annual output were laid out in a single line it would stretch over 100,000 miles. The brick industry has revolutionised the trade of Peterborough. Such is the wealth of clay and the profit to be drawn from it that one part of the brickmaking district has been fitly named "Klondyke." It lies in beds of enormous area and depth, and some of the experts say they could go on taking out the easily accessible clay for the next century without taking thought as to where the next supply of the material is to come from.

TRANSVERSE breaking-tests of plate glass furnished by several different makers were recently made at the Watertown Arsenal. From particulars given in the *Iron Age* we gather that the thickness of the glass varied from 1in. to 1in., and the span from 8in. to 24in. The modulus of rupture, which ranged from 2,000lb. to 8,000lb. per square inch, was generally greater with the lesser thicknesses. Of the various kinds of glass tested—rough, ribbed, polished, and wired—there was little difference in strength, except that the wired glass showed a little greater strength than the other kinds. The strength was also greater for the "sandwich rolled" than for the solid rolled wire glass. The strength of glass set in frames was practically double that of the specimens tested transversely.

There is a belief that the agitation for a new bridge over the Medway at Aylesford is beginning to have effect. A grant not exceeding £10,000 by the County Council would, it is held, meet all the necessities of the situation. The Rochester Bridge Wardens, it is believed, are prepared to contribute £25,000, and the Corporation of Maidstone, although the bridge will be entirely outside its jurisdiction, is relied on for £2,000 under a resolution passed some years ago. From other

sources contributions are expected which will, in the event of £10,000 being granted by the County Council, bring the total funds available up to at least £40,000, a sum sufficient, it is believed, to defray the entire cost of the new structure and of the necessary approaches. The plan which commends itself to the advocates of the new bridge is that of inviting competitive designs with a premium of, say, £100. This course, it is contended, would secure to the County Council, as the responsible authority, the best advice obtainable on bridge building, giving at the same time a sufficiently wide choice in the matter of architecture.

In the annual report of the water engineer to the city of Liverpool, Mr. Joseph Parry, there are several points of general interest. The total supply for 1902 was 17,572 million gallons—31·739 gallons per head of the population per day. This is distributed as follows: For domestic use and leakage on all pipes, 18·536; for trade purposes and meter, 7·822; for ships by meter, 0·578; for workhouses and industrial schools by meter, 0·672 per cent.; for extinguishing fires, ·020 (there was no serious fire during the year); for water for condensing at the pumping stations, 0·87; for miscellaneous purposes by assessment, 1·825; for public purposes, sewers, &c., 1·827; salt-water supplied for trade and public purposes, 0·372. Twenty per cent. of the visits of inspection resulted in the discovery of leakages, &c. The difference between the maximum and minimum week-day supply is only 9 per cent., but the Sunday demand is little more than half. A diagram showing hourly fluctuations indicates that the moment of maximum demand is between 10 a.m. and 11 a.m. in summer, but in winter this maximum is maintained almost throughout the day until 5 p.m. There is then a steady decrease until 2 a.m. or 3 a.m.

A NEEDLE-LIKE building has been planned by Mr. Arnold W. Brunner to occupy a 26ft. by 46ft. plot of land on New-street and Exchange-place, New York. It will be 18 stories high, and will be built for Mr. W. F. Havemeyer. After taking out the necessary space for elevator shafts, stairways, and corridors, each floor will have a rental space of 24ft. by 31ft. The structure is particularly interesting, because its erection will cut off the light of part of a large office building, which has already suffered from other neighbours in this way. The first of these lofty office structures were eagerly sought by people who desired to be isolated in airy, well-lighted rooms, but as their number has increased it has been found that, except on street frontages, an office on the fifteenth floor, say, may be no better than the accommodations afforded by the old buildings a few stories high.

Trade News.

WAGES MOVEMENTS.

SUNDERLAND.—There seems every probability of a lock-out occurring in connection with the operative joiners employed in the northern counties, this serious situation being, of course, largely attributable to the present Sunderland joiners' strike. The notices, which state that the lock-out will take effect on August 29 next, will be issued by Mr. W. H. Hope, of Sunderland, the secretary of the Northern Counties Federation of Building Trade Employers. If the dispute is not settled by a lock-out the Federation will then call upon the Yorkshire, Lancashire, and the Cheshire Federations, which combine to form the northern centre of the building trade employers, and with whose approval the present steps are being taken.

W. H. LASCELLES and Co.,

121, Bunhill Row, London, E.C.

TELEPHONE No. 270.

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CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXV.—No. 2536.

FRIDAY, AUGUST 14, 1903.

DESIGN AND SUPERVISION.

WHETHER the artist is always the most capable supervisor of his own design is a question of some interest. The modern professional architect, brought up and trained in an atmosphere of draughtsmanship and office routine, without the technical knowledge and experience of the craftsman, is certainly not the best supervisor of his own work. Even in the days of Vitruvius, who lays down the qualifications of the architect, it was considered that he was not the most skilful operator. The two functions are very different. A skilful planner may certainly not know the best mode of wall construction, or of laying foundations; and the artistic designer of an elevation may be quite ignorant of the best manner of giving effect to his design or details. The two things are quite separate, and will remain so, though there is no reason why the artist may not make himself a proficient supervisor of building operations as well. Certainly, if he wants to see his designs carried out in their integrity, in the true spirit in which they have been conceived, the best thing he can do is to make himself a master of the trades, and the way they should be carried out. And the earlier he makes himself a master of practical construction and technical methods of execution, the sooner will he be able to understand why certain designs and details he turns out of his office are misunderstood by the workman, or thought to be impracticable—why, in short, his detail drawings are sometimes altered, to their disadvantage in some respects, and why there is so much friction between himself and the contractor. And by making himself acquainted with the practical difficulties of execution, he will be perfecting his architectural training in the only real way. His practical training in the workshop and on the building in progress will react upon his design. He will begin to see things in a different light. For example, when he knows how to cut economically a block of stone for a cornice or a set of mullions, the detail of his cornice or the section of his mullions will be modified in a manner that will commend itself to the mason, if not to his own satisfaction. We can imagine the youthful and enthusiastic architectural designer sending in his first details, and the humility he must experience when the builder tells him they cannot be executed as shown. He may indeed feel indignant at any criticism on the part of the builder or workman, at the barefaced suggestion that his years of architectural study and sketching are to be thrown away simply because the mason or carpenter cannot understand the design, or has not science enough to grasp the solution. To him it resembles a druggist refusing to make up a doctor's prescription because he does not understand it. Probably the youthful architect would exclaim, "All things are possible if only competent craftsmen could be found." Such an idea, no doubt, has risen in the mind of many a young architect who has received his first "snubbing" at the hands of a workman by being told his drawing is not practicable. We do not deny that building contractors of a certain type are very obstinate in refusing to see any advantages in the architect's design; often ignorant of methods of doing work that they do not understand, or have not seen done before. There are occasions when the architect is right and the contractor wrong; when the

latter will not see things rightly because he has an interest in repudiating them, and is determined for the sake of a few pounds' saving to do the work his own way. Such men are, we hope, rare. Circumstances alter cases. When cost is not a consideration, the architect may be justified in disregarding economical methods of stone or timber cutting, in using solid masses; but the wiser policy is to endeavour to cut material to the best advantage, to use none wastefully. Experience in building operations will at least make it easier for the designer to co-operate with the craftsmen by making his detail drawings conform to methods of workmanship without exposing his design to the charge of being unworkable. The architect will have the satisfaction of being able to call to his aid methods of execution that will enhance the effect of the design. By knowing how certain things, like joinery, are executed, and the tools that are used, he can make them subserve his purpose. Ornamental effects may be obtained by the use of the tool to the surface of the wood in cutting simple devices, and in framing pieces together to produce a moulded effect. To take the construction, for example, of a wooden cornice over a shop made up of several pieces of wood. A joiner will have his own way of joining the pieces, of rebating and grooving and tonguing them together in the most economical manner. His method may not be the most satisfactory from the architect's point of view; but by knowing the method of cutting and jointing the latter may be able to construct a cornice that will give the effect of his design without cutting the mouldings out of the solid timber in a wasteful way. Small members may be moulded and grooved and tongued together and fixed on the brackets behind, which will give the desired effect with all the appearance of solidity obtainable in the solid. So in the detail of a skirting, very massive-looking and ornamental effects can be obtained by tonguing the separate moulded pieces together and fixing them on shaped backings without using any thick piece of wood or several mouldings cut out of the solid. Yet we have seen details drawn of a complicated set of mouldings without any reference to the methods of joining up the parts. We only instance these as examples of the value of understanding the trade methods as a means of producing the desired detail. Masons, carpenters, joiners, smiths, plumbers employ certain rules and methods of construction. If these are not understood or recognised in the architect's design, so much the worse for him, for the workman does not scruple to alter and misinterpret the intention where he finds it disobeys them. If workmanship is a true test of design, which it must be in architecture, the more skilled the architect is in the trades, the more likely he will be to express his ideas with truth and clearness. But this, we know, is a rather disputed question in the profession: while every architect acknowledges the importance of workmanship, there are many who consider it is distinct and subsidiary to design; that the architect should not be hampered or restricted by it. This opinion is strongly held by nearly all the members of the profession who belong to the older régime. They contend that the architect should be independent of the workman. In a particular sense, design is above craftsmanship. There are others of the more advanced school who believe that craftsmanship is the basis of design, that the architect must be a craftsman himself to enable him to embody honestly his intentions, and to this latter school many of our leading architects have attached themselves. The "handicraft movement" has considerably influenced the profession. We do not mean only in its opposition to machine labour, which it only does when machinery involves a loss of some artistic quality, but because of the deeper meaning

that handicraft is the only source of all good art in the past. The handicraftsman, to succeed, must be one who is able to determine every design by the gift of feeling, without which he can be no artist, as, for example, when and where machine labour may be used, and when not. And as design is largely a matter of feeling of artistic discrimination between right and wrong, it must be largely determined by the hand in co-operation with the eye or mind. It is in this sense—the gift of feeling, that design must to a very large extent be based on craftsmanship. The handicraftsman selects his own material, he considers what his work is to fulfil, and he shapes his material accordingly in the most convenient way, and this is the root idea of all true design. The extravagant phase of the French *L'Art Nouveau* style is the direct antithesis to this; it is really the result of making design independent of handicraft; it contradicts construction, makes everything subservient to a perverted perception, however bad and aimless; so that in these two modern movements we may very fairly judge the differences which divide the profession as to whether workmanship is the test of design or not. The test of the sensitive eye is absent in the New Art craze, which indulges in the most rococo and luxurious forms. The professional artist who looks with ill-concealed disdain at the workman's simple design is really in sympathy with the "New Art" which uses materials, not for their intrinsic value or beauty, but as fancy materials that can be made to imitate any other substance, and can be cut or tortured into shapes and purposes for which they are ill-adapted. Handicraft, on the contrary, follows the honest traditions of the best periods. One writer thus significantly puts the case. "In the old days the workman was his own designer. No one is prepared to assert that the Gothic carvers worked from other men's designs. But they did not have to work in different styles, which means that they applied themselves to their own, knew it, and could exhibit taste on it. Nowadays many workmen execute their own designs. But the times are evil; the workmen have to work in different styles, of which they know very little; facility and speed are everything, taste is nothing; the workmen's work is never really looked at—it is only part of the assertion of opulence, and is itself never cared about. With a revision to a simple style, one on which the workman can feel his way to individual expression, and in which he no longer repeats the formula of other times, he will be able to design simple patterns, and to make them evidence of intelligence and choice on his part." These observations apply not only to ornament, but to all architectural work. The designer commits himself to a style he does not know, because he has never been trained in it; but the old craftsman who was also his own designer, worked in one style—that in which he was brought up. Instead of designing in half a dozen or more diverse styles, he confined himself to the one which he had learned thoroughly, both on the building and in the workshops, and to which he could devote his whole time. The consequence was he could supervise his own design and make it appear just what he intended it should be—the only favourable condition on which design and workmanship can be united. As it is now, design is made a profession by itself; the architect learns to design in any style, it is a commercial transaction with him. But few men can learn to make careful drawings of work and master the handicrafts engaged in production at the same time. The design and work must go together—the artistic handicraft in short. Therefore we come to the only true conclusion, that the workmanship basis of design is the real one; the more the artist knows of the method of producing his work in certain materials the more

perfect he is. The sculptor and carver both execute their own design in the highest class of work; that artist is the most masterful and effective who can in the management and handling of the technical part of his art—the pigments, mixing, and manipulation—translate his ideas and impressions or passion on the canvas. The real artist has always been his own executant—the architect's work alone is divided. But it will be said the architect cannot execute his own designs in the same manner as other artists do. Under modern conditions it is impossible; the art of design has passed into the hands of a profession, the execution of construction into those of builders and contractors. The supervision of building is the one thing left to the profession to remind them of their original craft. It may be taken to be a remnant of the earlier practice, when the architect was the chief artificer and was master of the work. If the practice of supervising went, there would be nothing left to connect the architect's design with the real building. And yet there are some in the profession who would not trouble if this slight tie was also severed; they think that the superintendence of a building should be left to clerks of works who have been trained in the work. Practically this is the case already in the majority of large buildings, where the architect seldom puts in an appearance on the works unless it is convenient. The subject is one too large to discuss in one article. There are occasions when the complex nature of the building and its size renders the services of a resident superintendent indispensable; no architect engaged in professional work would have the time or opportunity of inspecting and examining everything in operation that was taking place. The practitioner likes to feel he is in touch with the building, and the process of superintendence enables him to be so. It enables him to have some control over work, to check irregularities or correct what is being done amiss, and to verify the work and details as the building proceeds. After actual execution of the work or the craftsmanship, superintendence occupies an important part, as it implies, of course, an acquaintance with the construction and methods of building, and its several trades. Hence it follows that the most competent superintendents of building operations are to be found amongst those who have a practical knowledge of the trades, and that clerks of works are generally recruited from men who have occupied the position of building foremen or master tradesmen. The architect has no such claim to practical knowledge of detail. He may, however, do much by assiduous attention, observation, and study to fulfil the duties of general supervisor of buildings over which he has control. Being the designer, he ought to be able to put his ideas in the material he employs, to master the best methods of carrying out his own details, though there are duties which might imply a considerable amount of personal observation and study of building operations far beyond the attainment of the average young architect, who has few opportunities of inspecting buildings during his three or four years' articleship, and his course of studies for the professional examinations. An ancient authority on architecture has said the architect should be more skilled as a judge than an operator. The observation leads us to a consideration of the question whether the judicial mind, one capable of weighing evidence or niceties of practice and of forming a comprehensive idea of the whole design, is not, after all, quite as well, if not better, qualified to supervise his own design than the craftsmen employed in the execution of the building. We do not deny our first enunciation that workmanship is the basis of design, but have to consider the modern practice of architecture as it obtains to-day—a number of separate trades employed by a

contractor who undertakes the work on commercial lines, and who has no personal interest in the design. Each workman may be the best judge of his own part of the work, but not that of his co-workers. The trades often overlap, or are in conflict with each other. A jury of workmen selected from the whole number may be competent to pronounce on the general excellence of the various trades as isolated features in the building, and yet be quite incompetent to give an opinion of the execution of the design. Here it is the competent architect's judgment is of value, not so much in assessing the merits and excellence of each trade as in determining the artistic merits of all trades as a whole. It is in this sense we think the supervision of the architect must be regarded. He is better able than the mechanical expert, generally untrained in the art of design, to judge of the effect of his work in relation to the whole building, to make allowances for conditions, to weigh the small *pros* and *cons.* of the technical observance of details to which many workmen attach too much importance, and to judge of the result and harmony of the work as an *ensemble*.

COTTAGE BUILDING.

ONE of the few classes of practice which often tax the architect is cottage building; and although there have been numerous letters, essays, and books published on the subject during the last quarter of a century, and it has claimed a large share of attention from social and sanitary reformers, the question of cottages for the labouring class is still a matter of controversy. The enormous increase of the population in our great towns and rural districts has led to the attention of all thinking men to the problem. Yearly a great number of the agricultural labouring class are drawn towards the large towns, where they seek work and recreation. The Garden City scheme has had many admirers, and the experiment has been tried with some success; but the requirements of the agricultural labourer and town workman are not to be met by the Garden Cities like Port Sunlight and Bourneville. They form a class of themselves. The agricultural labourer, it has been pointed out, has acquired his own habits of life; he does not study social problems with the same relish as his town brother; he is rather fonder of the village inn than of the club or mechanics' institute, and his home requirements and tastes are much more limited and more humble. The country cottage is a type of dwelling that cannot be compared with any we can show in the large town. The circumstances and conditions of each are different. In the country, of course, a good area of ground is required; there must be a garden—and what more reasonable or desirable? Another essential is that there should at least be a good-sized living-room, with a small scullery, bath, and sink attached. A common room, spacious enough for the family and a few visitors, is more necessary than two smaller rooms. It can be used as a parlour, a reading-room, or a washhouse. A few useful remarks on the subject were made the other day by Mr. Martin Shaw Briggs at the conference held at Bradford. As he said, much depends on the character of the landlord as to the character of the cottage. The Model By-laws have very seriously hindered the landlord in building cottages. These are points that have much to do with the kind and character of dwelling. The same writer said the "so-called cottages erected by artists and other Bohemians to recruit in the country at the week-end are of no use as types to follow," as they abound in "ingle nooks" and "dens," and other dainty little excrescences which the labourer does not require. Nor will the "flat" system of cottage-building help

the landed proprietor. As to materials and cost of building, the locality must in every case be considered. Where stone is plentiful, as in the North, Midlands, and Western districts of England, no material could be better, and good cottages, with parlour, living-room, and washhouse may cost anything between £250 to £350 in some parts where labour is moderate. Brick and concrete cottages can certainly be built cheaper in places where bricks and gravel are obtainable, and in blocks of three or more the price may be reduced. As an average estimate, 4½d. to 6d. per foot cube is reasonable in brick districts; for the latter sum per foot, brick and stone dressings, slate or tile roof, wood floors, and plastered walls may be obtained, the cottage comprising a parlour, a kitchen, small scullery, larder, and bedrooms, &c. Cottages of this general description have been erected in many parts of Hampshire and Sussex.

The requirements of plan vary with the condition and modes of life of the tenant. In the country, with a large plot of ground, a group of cottages will be often the best and most economical plan. There should, of course, be a front and back entrance. The size and number of the rooms will be determined by the requirements. In the smallest house there must be a common room or living-room, say 15ft. by 10ft. or 11ft., or about 150ft. square. It should be free from unnecessary breaks or furniture, yet arranged so that the fireplace should form a comfortable centre, cut off from direct draughts from door or window. Mr. Briggs mentions an elementary type of plan adopted by the Liverpool Corporation for their concrete flats. It has a living-room 15ft. by 10ft. 3in., with a large fireplace, the sink and copper occupy a small space of 4ft. by 3ft. 6in. at the back. The washhouse is also small. These flats cost only £100 each. A common washhouse is often essential, with bathrooms. The following are necessary on the ground floor: a living-room of the area mentioned, a ventilated food cupboard, such as may be seen in the Guinness Buildings in London, or washhouse or scullery with copper and sink, and perhaps a bathroom. Two types of plan are given in detail, which we may briefly describe. The front door opens into a lobby about 3ft. square, with stairs in front, about 2ft. 10in. wide, cut off from living-room; the latter is entered by a door on left of porch or lobby. It is about 160ft. square, with large fireplace in opposite wall, and cupboards in the recesses made by the jambs. An angle cupboard is suggested by the author of the paper. The window being in the entrance front, a good left-hand light is obtained for cooking. The height of rooms where oil is burnt may be lower than ordinarily, and 7ft. 3in. to 8ft. may be sufficient. The latter is the By-law regulation, but for country cottages the low rooms are more conducive to picturesque effect externally, as the eaves of roof can be kept low. The architect may indeed render these country cottages more pleasing if the old type of cottage is studied in the grouping and roofing. A small larder is obtained, and a store under the stairs with a door leading out of living-room. Behind is a small scullery, 10ft. by 6ft., with sink and bath, with door at the back protected by a small verandah which runs along the back front. Some ingenuity is necessary in planning a small scullery that will contain a 20-gallon copper, a sink, and a bath; though it has been done in several plans we have seen. It is certainly not necessary to trap a cottage sink if a discharge-pipe be provided over a three-gallon tipping basin above the ground or by other similar means. In another type of plan a parlour is placed in front of living-room, both being entered by the porch with a door between the two rooms. The parlour has an angle fireplace, the flue being taken into the stack of the living-room fireplace. A side window is shown for the latter. The

scullery, stores, and larder are arranged as in the first plan. We do not think a second sitting-room desirable in this form of cottage: it detracts from the size of the living-room. The front parlour, it is truly said, panders to a popular prejudice; it may be smaller than the living-room behind it. In Yorkshire Mr. Briggs says it is used as a Sunday afternoon sitting-room, and for the display of family photographs and ornaments; but the space it occupies is better used in making a larger living-room or kitchen—a more useful apartment for the agricultural labourer. The bedroom plans over show three rooms ingeniously arranged from a small stair landing, with three independent doors opening into them. The partitions are so formed as to give bed recesses in some cases in the smaller rooms; there is a linen closet from the front bedroom over lobby. The area of each bedroom ought to be about 80ft., each with small register stoves: the front one larger. We have thus described two types of cottages illustrated by Mr. Briggs. In both cases the coal-store and c.c. are detached, outside. We do not think they are the most perfect in plan for every situation. The lobby and straight staircase are rather cramped for a country cottage, and we think it is possible to devise a larger lobby entrance between every two cottages, the recesses internally being utilised for stores or larder, and the stairs made to ascend from the living-room at the inner side by a few return steps from the room. For single or double groups of cottages where there is ample space, corner porches or lobbies can be arranged within the boundary lines of main walls. The types of many of the old country roadside cottages with gabled projections other than rectangular in shape, afford considerable variety of elevation and roofing, and can be utilised by the architect. More comfort internally can be secured by a cottage with few well-devised breaks and recesses than in one of the box-like type, and many old cottages in Surrey, Sussex, and Devonshire furnish suggestions. The conditions of country life are not to be found in the town, so that the most perfect self-contained examples of model town labourer dwellings afford us very little to the purpose. One writer who has studied the question of cottage plans makes a few useful remarks. One of the paramount duties of the cottage-builder is to closely study the life and habits of the tenant; except we do, it is impossible to design a house to properly accommodate that life. The living-room, being the one most continuously used, must be liberally provided. The agricultural labourer lives largely out of doors; when he comes home for shelter and rest he naturally looks for one room—the living-room—it is the room where the wife prepares the meals, which is constantly in use, where the one fire can be lit for cooking and warmth, where the daily domestic work will be done, where the children will be gathered during the winter months. It should, therefore, be roomy and comfortable, having a cheerful aspect and outlook. There should be room in it to move about, to work, and to obtain rest. It should have a good cooking-stove, good cupboards, and dresser; the doors and stairs should be so placed as not to create draught or destroy the comfort. The doors ought to be not in a direct line with the fire, a plan that is best secured by having a recessed porch, so as to screen the fireplace, and provide seats near the window, which would thus be recessed. An inset porch answers the purpose best. The outer door should act as a screen to the fire, not, as is often the case, so placed as to create a direct draught across the window to the fire, and so spoil the most useful part of the room for sitting. The architect, in his planning of cottages, above all other kinds of dwelling, has to make the very best of his space, to consider the position

of the occupants at work or at rest, to allow space for the absolutely necessary fittings and furniture, and to endeavour to impart a sense of comfort in his living-room and bedrooms. The less the accommodation provided the more it is necessary to study these details of plan, so as to utilise to the utmost every square foot and inch of the space. To this end the design of all useful fittings and furniture should be considered in the plan. The positions of cupboards, seats, dressers, sinks, and stoves ought to be settled in the scheme quite as much as the position of doors and windows. As the landlord is the builder of country cottages, not the speculative builder or the company, the designer of these buildings has to approach the problem on a different level. The cottage has to be built for the poorest class, and every effort has to be made by the profession engaged on this class of work to avoid useless expense if they desire to keep the country cottage out of the hands of the speculative builder, or to encourage the country landlord to improve the accommodation and appearance of these humble structures. No doubt there is something to be said for Government undertaking the purchase of plots for this purpose; but the question need not be discussed here.

EXTENSION OF THE BRITISH MUSEUM.

A SCHEME for the extension of the British Museum has been for some years in contemplation, and is now about to be partially carried out by the designs of Mr. Henry Tanner, I.S.O., F.R.I.B.A., of H.M. Office of Works. A plan, we believe, was prepared by his predecessor, now Sir John Taylor, K.C.B., for certain additions to the edifice many years ago, but was never carried into execution. Sir Robert Smirke's columnar front in Bloomsbury was considered in its day one of the masterpieces of the Classic Revival. About a million sterling was, we believe, spent in its erection. The original architect had a good site to deal with, and was almost unfettered, yet perhaps few buildings were more criticised in its day. The original Montague House which it replaces was taken down piecemeal to make room for Smirke's design, the eastern side of which, that towards Montague-street, was first built in 1828, when the Royal library of George III. was deposited in it. The north, south, and western sides were afterwards erected as we now see them. The style, as most of our readers know, is Grecian Ionic, and few who look upon the huge façade towards Great Russell-street will hesitate to acknowledge that thousands of pounds were wasted on the erection of the colossal portico and the colonnaded wings. Fergusson, who was no admirer of Classic for new buildings, refers to the absurdity of placing forty-four useless columns 45ft. in height just round the front while the flanks are left bare. But the design of the present architect to H.M. Office of Works will be a commonsense addition of an important block facing Montague-place on the north side. The elevation, while it carries on the proportions of the façades, will be dignified for its purpose, and this scheme of external blocks round the north, east, and west sides of the present building will eventually afford ample space for the vast collections stored therein, besides rooms for students, &c. When the scheme is complete, the new blocks will, in fact, form the three sides of an external quadrangle, with space between the old and new buildings. The plan of the present museum is indeed a complete quadrangle, with its main entrance front towards Great Russell-street. The portico and colonnades will remain as they are. Describing the design, which, through the courtesy of Mr. Tanner, the architect, we have been able to see, we may say that the proposed extension will form a long range of galleries on the north side, towards Montague-place, about 380ft. in length between the corner blocks, which will unite it to the east and west blocks when complete. The block to be built comprises a central entrance portico of six detached columns, with flight of steps to the ground floor, a central hall with a long gallery 166ft. by 50ft. on each side. Above the ground floor there is a mezzanine, comprising rooms for assistants, studies, and offices, about 27ft. by 24ft. each. The east half of the floor is for the

prints and drawings department, and on the other half will be housed the Egyptian and Assyrian antiquities. A row of presses are also shown on the inner side. On the floor above are provided students' rooms and galleries. The top floor is lighted by skylights, without windows, and is included within the blank walling, cornice, and attic above the first-floor windows. The basement of the building comprises ample storage room, the side of the area being extended by means of glass roofs, between which and the main area are piers. There is a wide space also under the front, top-lighted. The sub-ground floor is devoted to receiving and packing-rooms, 55ft. by 40ft., in addition to storage area. Between the new and the old building, and connecting them on each floor, is a small block containing lavatories and waiting-room on the one side, and the stairs and conveniences on the other. These blocks are placed in the open area, between the two structures, and are isolated on both sides, affording good ventilation. The ground-floor story will have a height of 22ft., the mezzanine 14ft., and the upper story 20ft. We hope soon to illustrate the plans of the new block and the elevation towards Montague-place. The central hexastyle portico and the extreme projecting wings, when these are completed, will correspond in style with the remaining portions of the museum. The two tiers of windows are plainly treated, and will give ample light to the main ground story and one above. Portland stone and brickwork will be used in the construction—the former in the portico, columns, entablature, and window-dressings—and the estimated cost of the proposed extension is £200,000, of which £50,000 will be provided out of funds bequeathed to the trustees of the British Museum. The sketch plans have been on view in the tearoom of the House of Commons. When the scheme is fully carried out the museum will be considerably increased in area. The new façades will incase, as it were, the existing old galleries, and will be in accord with the architectural style of the building. As the great national storehouse of the antiquities of the Empire, in which are stored the finest remains of Greek and Roman art collected by the late Charles Townley, the famed Elgin marbles from the Parthenon, the pedimental sculptures, the Hellenic marbles, and the Egyptian and Assyrian sculptures, the British Museum will always possess intrinsic value to the connoisseur and architect for study. The new galleries will afford the student and collector better facilities for their research and labour than they have hitherto possessed, and we therefore look forward with satisfaction to the additions about to be made to render this treasure-house worthy of its reputation.

STANDARD SECTIONS FOR TRAMWAY RAILS.

WE have received a copy of the "Tramway Rail Specification" issued by the Engineering Standards Committee, a publication which will be welcomed by all engineers and promoters and authorities engaged in tramway construction. The Engineering Standards Committee, which is supported by several influential professional institutions, including the Institution of Civil Engineers, the Institution of Mechanical Engineers, Naval Architects, and of the Electrical Engineers, has accomplished a very useful work in publishing sections and specifications which will be of indispensable service to all engineers who are planning and specifying tramways. The clauses are numbered for specification purposes. The first clause provides that "the steel for the rails shall be of the best quality made by the acid Bessemer, basic Bessemer, or other approved process," and gives the chemical composition, in which the carbon is to be from 0.40 to 0.55 per cent., and the manganese from 0.70 to 1.0 per cent., &c. Referring to the sections, minute particulars are given. The sheets of full-size sections show every dimension and radius of the smallest curve, and range from "B.S." section 90lb. per yard to "B.S." section 116lb. per yard for use on curves. There are ten sections given and numbered. No. 1 section, 90lb. per yard, gives a rail 6½in. depth to lower bed-plate or flange, and 3½in. wide at the top, and 6½in. at the bottom flange, so that the depth and lower flange width are the same. Clauses are given for every section for straight or curved track only necessary to be filled up by the No. weight per lineal yard, and a table of general dimensions of "B.S." rails is appended. No. 3 section has a

height of 6½ in. and a width of flange of 7 in., and has a weight of 100 lb. per foot run; No. 4, 7 in. by 7 in., weighs 105 lb., No. 5, of the same dimensions, weighs 110 lb., and this height and width are the greatest. Rails are to be paid for according to the actual weights before drilling or punching, and such weight is to be ascertained during the rolling. Two sets of templates, internal and external, of each "E.S." section, are to be supplied by the manufacturers (if required) before the rails are manufactured. The length of rail for straight track is to be either 35 ft., 45 ft., or 60 ft., and clause 10 provides the maximum proportion of short lengths which shall be accepted. The normal length of rails for curved tracks is 35 ft., and 5 per cent. in number of rails are to be accepted in lengths of 30 ft., 2½ per cent. in lengths of 25 ft., and 2½ per cent. in lengths of 20 ft.

Referring to the tests, it is provided in clause 17 that out of each 80 rails one may be selected by the inspector as a sample, and a 5 ft. length cut therefrom which shall be supported on solid iron bearings 3 ft. 6 in. apart in the clear. Such piece of rail is to receive a blow in the middle from a ball or tup weighing not less than 2,240 lb., the striking force of which shall have a radius not greater than 9 in.; the tup shall have a fall of 15 ft. for rails less than 100 lb. per yard, and of 18 ft. for rails of 100 lb. and over per yard. The ultimate tensile stress required (clause 18), is not to be less than 40 tons per square inch, with an elongation of not less than 12 per cent. on a length of 2 in. The bending test is equally severe: the rail shall be bent sideways by pressure to a curve of 30 ft. radius without showing signs of cracking. If not satisfactory, these tests are to be repeated; in the case of tensile stress a second rail is to be tried, and if it fails the whole of the rails may be rejected. Clauses 22, 23, &c., specify the holes to be made for fish-bolts and joint-plates and their diameters and position. All rails accepted are to be stamped in the presence of the inspector. The fish-plates are also shown on each of the illustrated sections. For the inner fish-plate of the lighter sections of rail, they are to be 2 ft. long and 22½ lb. weight, and for the outer fish-plate the same length, 27½ lb.; for rails 105 lb. weight the inner fish-plates are to weigh 26 lb., and the outer 30½ lb. We may state, for the information of the reader, that copies of the specification and sections may be obtained on application to the Secretary of the Committee, Mr. Leslie S. Robertson, M.Inst.C.E., 28, Victoria-street, Westminster, or from the publishers, William Clowes and Sons, Ltd., 23, Cockspur-street, Charing Cross. Separate copies of each standard tramway rail section can be obtained, price 1s. 1d. post free, also sets of templates. We must assume that the sections given are those which scientific knowledge and experience have dictated. The groove for the wheel measures in all the lighter sections, ¾ in. by 1½ in., though bevelled to a narrower width at bottom of groove with rounded corners; the flat bearing portion of upper flange varies in the lighter sections: it measures 1½ in. from groove to outside of flange, in the heavier sections 2 in. and 2½ in. The upper bearing flange has a bevel or slope of 1 in. 21 to the inside of track, and a thickness of 1½ in. to 1¾ in. The tendency is to increase the depth of groove, and to make the "lip" of rail extend, especially in curves. There is ample play given to the tire of wheels, and the curves are such as to minimise the friction on surfaces as much as possible.

"BUILDING NEWS" DESIGNING CLUB.

A BAND STAND AND TEA PAVILION.

AMONGST the multifarious undertakings imposed upon the county councils and district councils by the Legislature and needs of the times, few duties are more obvious and necessary than the work of securing open spaces and recreation grounds in populous places. Parks and public gardens necessitate band-stands and refreshment pavilions. These generally are designed by surveyors and their draughtsmen, who obviously, judging by results, are quite incapable of producing suitable plans for such buildings, and manufacturers of cast-iron goods are contracted with to design and supply kiosks and such-like erections, but it is only too seldom that vulgarity is avoided, and monstrosities result. The fact is, the authorities themselves, like the man in the street or the free and independent ratepayer, generally display the utmost indifference to art

influences, thinking, as a rule, that so much frilling of ornament, so-called, adds more or less, according to price, to the beauty of any building, and specially to park architecture. The more pretensions the more one is supposed to get for the money. Besides, garishness appeals to the vulgar, and popularity is accorded to a project so perpetuated. It can be only by hammering away in season and out of season that matters in this respect will be mended. The best way to insure such a much-to-be-desired result is by practical demonstration to show how such buildings ought to be designed. With this idea we set the subject for our Designing Club; but, we fear, with only qualified results. As a matter of fact it requires a considerable amount of skill and good taste to produce an artistically designed band-stand, which shall serve its purpose properly, and present an attractive appearance without being overdone. It is the easiest thing in the world to draw out a bald baldachin on square or circular posts—a sort of cow-shelter which, with a thatched roof, would do very well in a field or wilderness park. That only presents the elements of the problems. A refined taste, probably, would not depart far from the elementary idea; but clearly, to be a success, a band-stand should carry the conception to a more decided conclusion. Our readers must judge for themselves as to whether "All British," "Needle Points," and "Solo," the three designs which we have awarded places to in this order, merit approval or not. They are the best of all the designs submitted in this the final contest for the Club session, 1902-3. "All British" says his mission as an architect is "to deal rather with larger issues of building, leaving the craftsman to fill in the detail which he [the architect presumably] inspires as he moves among them." In the absence of a venacular art it is hardly clear what the result of such a relegation of detail would amount to, and we doubt the redemption of labour to a higher plane while trade-unionism levels labour by destroying all chance of individuality by penalising it in every direction. Be that as it may, an architect can only rely on himself, and the more carefully he details his work the better the result will be. The pretty fancy of the tubular bells electrically operated to justify the sort of ventilating turret which "All British" calls his "little belfry," rather reduces his design to toy-like proportion with its dodecagon plan and flying buttresses. The shutters would be rather bothersome to shift. The tea pavilion is better than any of the others; but we do not understand what the scale-like flounce to the verandah openings at the ends is intended to represent, and it is not clear as to how "Rhoda's Pagoda" flag would be hoisted through the ventilator box.

"Needle Points" brings matters more nearly to the ordinarily possible, and on the whole he assimilates the likely with an amount of refinement which must be recognised, though we are aware that his proposal suggests too much the cabinet-maker with the puny spandrel panels and commonplace trusses on which the semicircular wood archings rest. This shape is a brick or stone form, and is not adapted to wood, particularly out of doors, for it is bound to crack and weather badly where it is cut out of the cross grain. The roller shutters look ugly when down, but they are more handy than shifting leaves hooked in on pins as in the first design. The tea-room plan is good, but we do not like its exterior. It is wanting in simplicity.

"Solo," the third man, does not improve his bandstand by the sight of his detail. The Ionic half-columns are much too tall in proportion for such mutilation, and their volutes are badly drawn. The inner ones would be soon knocked off by the shutters running up and down. The roof is not happy. In perspective it would look like a flat, with a spire rising in the centre to carry the vane. The pavilion is better with the corner set bays; but all four should have been thrown into the room, and the kitchen would have been better located as a wing to the rear, something like the one "Needle Points" has drawn.

"Lot" would have stood higher if he had not made the initial mistake of dropping his revolving shutters from the eaves of his bandstand, so that, being without guides to run in, they would hang into space beyond the lines of the angle-posts, and thus have a space between. He draws all upon one side of his sheet of paper, crowding the parts together, and doing his plan to half-scale, leaving any amount of paper vacant. "Lot" should stand better another time. "Brassey" gives a

circular bandstand, and puts sinking sashes to drop into pockets which are segmental on plan, and so are calculated to give trouble by hanging up awkwardly. His design is quiet and commonplace, but his pavilion, with half-round bays, would be pretty. "Pan" cuts the angles off a square plan for the bandstand, and fills the eaves in with lead quarry glazing in "cathedral" glass, possibly with bull's-eyes. The ceiling is flat, and shutters revolve from behind a cove. "Icicle" disappoints us again. He mixes up all kinds of detail so, and lets go good proportion entirely. We really cannot spare the time to pull his detail to pieces; but he is good man enough to realise that carved work and copper repousse ill-accord with strutted circular-cut timber projections mortised into sole-pieces. Shaped flat balusters of varied shape quarrel with the moulded cappings to the posts. The roofing of the tea-room is too clever by half, and inside the room is crowded. "James" sends an ugly fronted pavilion with recessed segmental seats. The detail is better than the small scale for the band stand would suggest, as his columns are not shaped really like tapering sausages, as if entasis was got by a mere swelling in the middle of a length. "The Kid" is no doubt a clever one with a fancy for Arts and Crafts vagaries full of odd fancies. The four little courting alcove rooms called ingles would never do for a public refreshment pavilion in a park, though the idea is suggestive. Upstairs there is a balcony which is omitted in the side elevation. Why the lamp should be placed in the centre of the outlook, to knock the spectator in the eye is not obvious, with its spiky Japanese freedom, done in copper, and Noah's ark trees to match. "Bon Bon" sends a sort of bandbox design, with a pepper-caster roof. He shows ingenuity, however, and is painstaking, but misdirects his energies into circular forms till we get a circular kitchen half open to the room, the completed figure being made up with counters. The centre of the tea-room is devoted to a dog-legged stair leading to two cramped balcony bays above, which would only lead to a difficulty in police supervision among the visitors who of necessity are very mixed in public parks. "Peg," if more ordinary, avoids such difficulties, and at least his designs are practical and roomy. His bandstand is better than the pavilion. "Calabar" prints his name so that it can hardly be read. His designs are involved, and want simple notions. "Ogee" is a most careful worker, drawing with a fine line and showing on all his scantlings. We wish we could place him higher.

The following were the conditions for the competition issued to the members of our club:—"A teak-constructed Bandstand, for erection by a county council in a public recreation ground, and a detached Refreshment Pavilion in half-timber. The former to be 25 ft. diameter, and open at the sides, with shutters to moderate the draught and exclude the weather. The roof to be covered with oak shingles. The floor to be 2 ft. above the ground level. A detail of one bay to ¾ in. scale to be provided, with sections of parts shown. The structure can assume any suitable form, but simplicity is desired, and the detail must be adapted to an exposed situation. The Refreshment Pavilion is to be 30 ft. long by 18 ft. wide, and to have a small kitchen included in these dimensions at one end for making tea, &c. A counter is essential, and a feature may be made of projecting bays for table alcove recesses out of the room. The eaves to be 10 ft. above the floor, which is 1 ft. above the ground level. No exception would be taken to a verandah. Roof to be red-tiled and have good eaves, but no ornamental cresting. No sanitary provisions are needed, as a convenience exists in the vicinity of the proposed pavilion. The cost of both buildings will have to be submitted to the Local Government Board. Scale, 8 ft. to the inch, and sufficient drawings to illustrate the scheme, but no perspective sketches. The plans, if space is limited, may be drawn to a less scale."

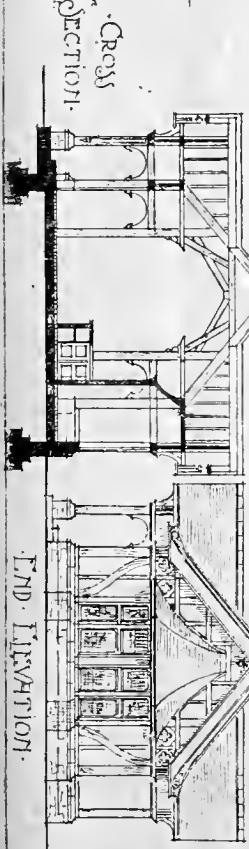
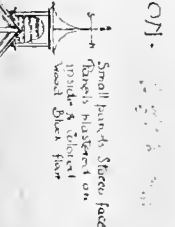
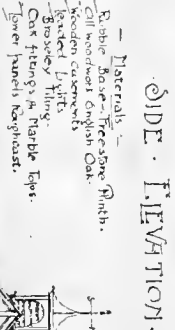
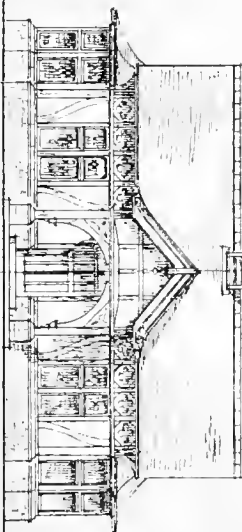
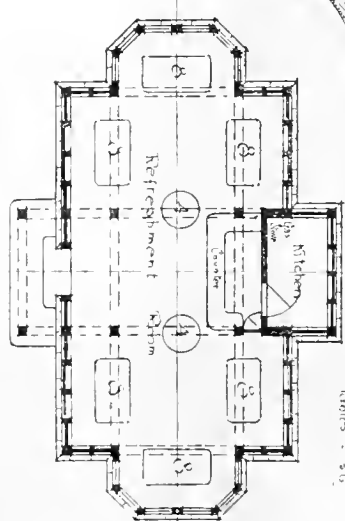
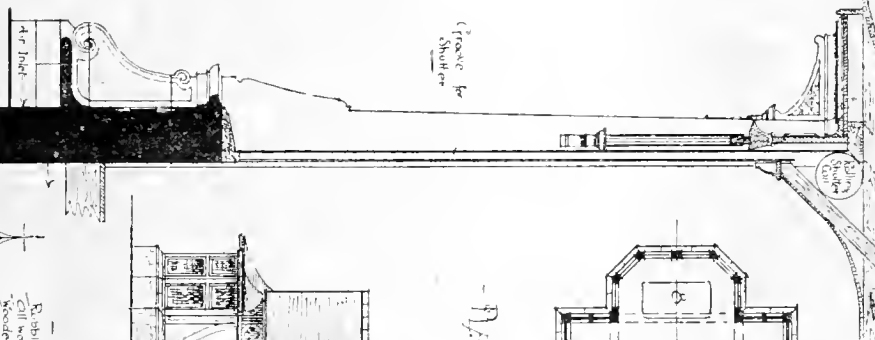
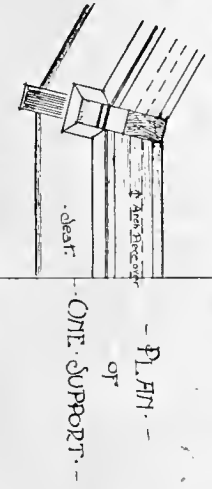
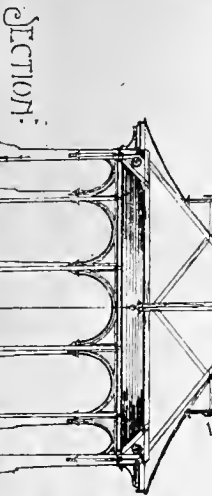
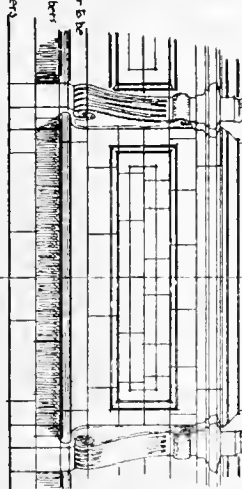
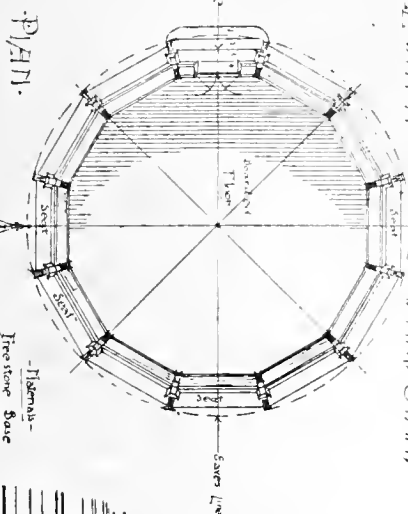
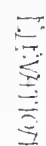
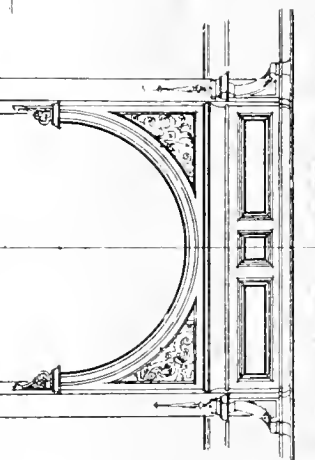
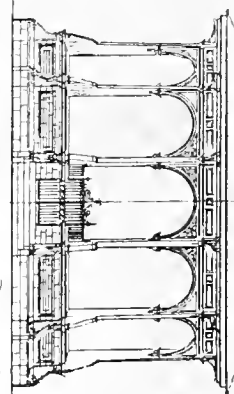
The new session of the BUILDING NEWS Designing Club will commence in October, when the award of the prizes for the past session will be announced.

A scheme of sewerage and sewage disposal is about to be carried out by the Guildford Town Council, for which a loan of £1,475 has been sanctioned by the Local Government Board.

The Castle Museum Committee of Nottingham Corporation, at the next meeting of the Corporation, will ask for a loan of £10,000 for restoration and other works at Nottingham Castle.

PLACED SECOND -
BIRD - BIRD STAND - & - KIRILYALIN - ROTT

Dr. HEDDIE PHINIS



Labels - attached

— Materials —
 Bible, Paper, Needle, Pin.
 All woodwork English Oak.
 Wooden casements.
 Painted Lights.
 Grooved Mouldings.
 Oak fittings in Marble Top.
 Green painted Acacia-wood.

Small painted Shere facade
Ramp's blastrest on
inside & distant
wood blue floor

Scale for General Arrangement:

Scale for Detail

SECTION.

of
CONC. SUPPLY.

Field or Laboratory Room

GUIDE · L. EVASTION ·

Grave for
Shutter

THE UNIVERSITY OF CHICAGO

5 days later

PLAN

- Plasma -
- Firestone Base
- York Stone Steps
- 4 seats.
- Call covered timber to
- leak
- Fir Roof & Floor timbers
- Oak Shingles
- Wat Iron
- Removing Shuttered

SECTION:

Best:

CON. SUPPOT.

SECTION.

END. ILLUSTRATION.

RULES AND REGULATIONS FOR ADMISSION TO THE SCHOOLS OF THE ROYAL ACADEMY.

1. **A**DMISSION to the schools can, subject to passing the required examination, be obtained at any age. But no student is eligible to compete for any scholarship, prize, or medal who is more than twenty-eight years of age on the date fixed for the delivery of the competition works, or of the works for the admission of probationers (see Rule 3).

2. All instructions in the Academy is gratuitous: but the student must provide his own materials, with the exception of clay for modelling, which will be provided and maintained by the Academy, and is not to be removed.

3. Applicants for admission must obtain from the Registrar, through the written request of any member of the Academy, or other artist or person of known respectability, a printed form, to be filled up and delivered at the Royal Academy, together with a certificate of birth and the works required as specimens of ability, on or before January 1 or July 1. Architects must also send a certificate from an architect member of the Royal Academy, of the Royal Institute of British Architects, or any other public Institution for teaching art and science, certifying that the applicant has followed up the study of architecture and architectural drawing, and has acquired a fair degree of proficiency in the same. The age and sex of the applicants must in all cases be stated on the face of the works submitted, and also the place where they have studied.

4. The works required are:—

Painters: (1) A finished drawing in chalk, not less than 2ft. high, of an undraped antique statue; (2) a drawing of a figure from the life; (3) a painting of a head, life size, from the life; (4) a design for a composition. The size of each work to be 30in. by 22in. and unmounted.

Sculptors: (1) A model, in the round, about 2ft. high, of an undraped antique statue; (2) a model, in the round, of a figure from the life; (3) a drawing of a figure from the life; (4) a model of a composition. The size of the drawing to be 30in. by 22in. and unmounted.

Architects: (1) An elevation and plan of a building, or some part of a building, to be done from the candidates' own notes and measurements, which shall be submitted with the drawing; the notes and measurements to be taken from the building itself; (2) geometric elevations of the Doric, Ionic, and Corinthian orders, with their entablatures complete, to $\frac{1}{2}$ in. scale, the columns to be 2ft. high; (3) an original perspective sketch in pencil of an existing building, or part of a building, on a quarter-sheet of imperial paper; (4) a drawing of a piece of architectural ornament from a cast, shaded in pencil or chalk, or tinted, and of the size of the original. All the drawings required must be on paper and unmounted; or there may be submitted instead of works (3) and (4) a portfolio of not less than six original sketches of architecture, of which one shall be an original design, and at least two others shaded studies of architectural sculptured ornament.

5. The above required specimens of the applicants' ability will be submitted, within two weeks of the date of their being sent in, to the Council, who will admit as probationers those whom they consider qualified to try for admission as students.

6. Notice of their admission as probationers will be sent to the successful applicants, and they will be summoned to attend on a fixed day at the Academy, and there execute the following works:—

Painters: (1) A painting of a head, life-size, from the life, to be done in six days of $3\frac{1}{2}$ hours each day, 9.30 a.m. to 1 p.m.; (2) a drawing not less than 2ft. high of a figure from the life, to be done in six evenings of two hours each evening, 6 p.m. to 8 p.m.; (3) a sketch of a design of a given size in black and white, from a subject to be set by the Keeper, to be done in one day, 9.30 a.m. to 4 p.m.

Sculptors: (1) A model in the round 2ft. high of a figure from the life, to be done in eleven days of $3\frac{1}{2}$ hours each day, 9.30 a.m. to 1 p.m.; (2) a drawing of a figure from the life, not less than 2ft. high, to be done in six evenings of two hours each evening, 6 p.m. to 8 p.m.; (3) a model of a design in clay or wax, from a subject to be set by the Keeper, to be done in one day, 9.30 a.m. to 4 p.m.

Architects: (1) A drawing from memory of one

of the Orders, to $\frac{1}{2}$ in. scale, the Order and height of the Order to be fixed by the council, and no book or other aid allowed, to be done in one evening of two hours, 6 p.m. to 8 p.m.; (2) a drawing from a cast, the size of the original, to be done in three evenings of two hours each, 6 p.m. to 8 p.m.; (3) an elevation and plan of a building, or of some part of a building, or of one of the larger architectural works in any museum, to be done in two evenings of two hours each, 6 p.m. to 8 p.m., from the probationer's own notes and measurements, taken from the building itself, the notes and measurements to be submitted to the Council; (4) an architectural design, to be a subject chosen by the visitor for the time being, to be done in six evenings of two hours each, 6 p.m. to 8 p.m.; the drawings to be carried far enough to explain the design, but not necessarily to be finished, it being understood that the merit of the conception will chiefly be considered; a rough sketch to be done on the first evening which must be generally adhered to in working out the design.

7. In addition to submitting the above works to the Council, painters and sculptors will have to pass an examination in anatomy and perspective, and architects an examination in perspective and the history of architecture. The examiners will be appointed by the Council.

8. Those probationers who are successful will be admitted students of the Royal Academy for a first term of three years.

9. Two scholarships, each of the value of £40 a year, and tenable for one year, called respectively the "Landseer Scholarship" in painting and in sculpture, will be given, subject to the limitation as to age (see Rule 1), to the students in painting and sculpture respectively who shall pass the best examination for admission to the first term of studentship.

10. At the end of the three years, subject to the fulfilment of certain conditions and the passing an examination, students will be admitted for a further period of two years. The full period of studentship is limited to five years, and cannot be extended or renewed.

11. All the drawings and models submitted by applicants for admission as probationers must be removed by them personally, or through an agent, within one month from the date of sending in. Any works not removed at the end of the month will be destroyed. The Academy cannot undertake to pack and forward any works.

12. Applicants who have been unsuccessful in their first endeavours to gain admission as probationers can renew their application at any subsequent period, by again going through the prescribed forms (see Rules 3 and 4); but the works submitted must not be the same as those sent in on any previous occasion.

N.B.—These rules and regulations will come into force at the examination for admission in January, 1904.

By order of Council,
August, 1903. FRED A. EATON, Sec.

MANCHESTER SCHOOL OF ARCHITECTURE.

THE Manchester School of Architecture has been established pursuant to arrangements made between the Owens College, the Manchester Municipal School of Technology, the Municipal School of Art, and the Manchester Society of Architects. On the advisory committee of a dozen members are Mr. J. W. Beaumont, F.R.I.B.A., Mr. Paul Ogden, F.R.I.B.A., the Principal of the Municipal School of Technology, and the Principal of the Owens College. Professor S. H. Capper, M.A., A.R.I.B.A., at present Professor of Architecture at McGill University, Montreal, has been appointed as director of the school. The following courses have been arranged, subject to such modifications as may be found requisite on Professor Capper's arrival in Manchester in September, viz.:—(1) History of Architecture: A general survey of architectural history from Ancient Egypt to modern times, with special reference to the evolution of styles and to constructional forms and methods. The course includes: Ancient Egypt and Assyria; Greece; Rome; Byzantine and Early Christian Architecture; Romanesque; Monastic; Gothic; Renaissance. (2) Elements of Architecture. The Classical orders, Greek and Roman, their mouldings and details; arcading, Classical and Gothic. Gothic mouldings and

details; their construction and design; elements of architectural effect; composition and style. (3) Architectural Drawing and Design: Studies of the orders; rendering with pen and brush; elementary design. (4) Freehand Drawing and Modelling. Mr. Glazier, A.R.I.B.A., Mr. Corbett, A.R.I.B.A., and other members of the staff of the School of Technology and of the Municipal School of Art will take part in the instruction given in those departments respectively. The above courses are intended:—(1) For students who intend to take the degree of the Victoria University in the Honours School of Architecture. (2) For students who desire to take a full course in architecture without proceeding to the degree. (3) For students who desire to attend any of the special lecture courses of Professor Capper. (4) For students who desire to attend special courses at the School of Technology or School of Art, including certain of the courses in the School of Architecture. An announcement will be made after Professor Capper's arrival in Manchester as to courses for a second and third year. A further announcement will also be made with regard to the classes on Building Materials and Construction, Descriptive Engineering and Sanitary Engineering. A course of four popular introductory lectures will be given by Professor Capper in the Whitworth Hall, in October and November, at 8 p.m. Subject, "History in Architecture: the Medieval Abbey and Monastic Orders and the Medieval Cathedral." Admission to these lectures will be free.

THE LARGEST STEEL BEAM IN THE WORLD.

THE largest steel beam in the world has recently been placed in the framework of the New Amsterdam Theatre on Forty-second-street near Seventh-avenue. It is 85ft. long, 12ft. wide, and weighs 42 tons. This beam was placed in position high in the air, supported only by a light and frail-looking trestle of structural steel. Of course, the steel supports of a great building that is two complete theatres in one are anything but frail; but the big beam which, standing on edge, was twice the height of a tall man, seemed perilously insecure until the network of supporting beams grew around it.

The giant piece of steel serves a unique and important purpose. From it the large gallery of the lower theatre is to be suspended, so that there will be no pillars to obstruct the view of those either in the balcony or the gallery. In addition the beam supports the floor of the upper theatre, so that it is really the mammoth key of the intricate structure. It was made in Trenton, N.J., and was shipped in sections to New York. The work of assembling these massive sections in place on the trestle and uniting them with white-hot rivets constituted an engineering feat of considerable enterprise.

Theatres have been built of structural steel before, but the New Amsterdam is claimed to be a distinct advance. A unique feature is the double stage in the main or lower theatre. It is to be so built that it can easily be lowered, divided into two and slid aside while another stage, already "set" for the next act, is brought up from a still lower level to take its place. In this way it will be possible to make the most elaborate changes of scenery required in modern productions in two or three minutes.

A further step in the new attack on Lord Penrhyn's monopoly of slate quarrying in Bethesda was taken on Monday. The Pantdreiniog Quarry, which is one of a number to be acquired by the new Co-operative Slate Quarrying Company, and which contains a vein of slate similar to that which has made the Penrhyn quarries famous, was double-staffed and worked by two gangs, one commencing work at four o'clock in the morning and continuing till noon, the other from twelve till nine.

The Governors of the Lincoln Grammar-school have selected Mr. Leonard Stokes, of London, as the architect of the proposed new school to be erected on the Wragby-road site.

The village of High Garrett, near Braintree, was brought under the hammer last week, in 20 lots, which, with the exception of three or four, made good prices. Amongst the unsold lots were the village schools, for which there was no bid, and a public-house, which was withdrawn at £1,800. The property sold realised just under £10,000. The village was formerly owned by the late founder of the great silk crape industry which has its works in neighbouring parishes.

OBITUARY.

MR. THOMAS POTTER, architect, of Sevenoaks, died on Thursday night in last week at his residence, Clarendon, Granville-road. The deceased, who was 58 years of age, was a native of Maidstone and served a term in the office of Mr. J. S. Anson, of Week-street, in that town. Removing to Sevenoaks many years ago, he started business as an architect and surveyor, and in the course of time built up a large practice. He soon began to manifest an interest in local affairs, and for many years he served the town on the old local board, and its successor the urban district council. He was appointed Conservative agent for the district, and in that capacity suggested, and afterwards carried out, the scheme of providing a club and a public hall. He was also architect for the Dunton Green Church, for the new St. John's National Schools, and for a large number of the most prominent private residences erected in the district during the last 20 years. Some two years since it was found that he was suffering from an internal growth, and the case from the first was a hopeless one. Until recently he has kept to his business, being wheeled about in an invalid chair, but about a week ago the disease assumed a most serious form, and from that time he lay in a state of coma until his death.

THE death is announced of Mr. ANDREW CALDERWOOD, J.P., builder, Ellis-street, Kilmarnock, at the age of 55 years. Besides carrying on an extensive business, Mr. Calderwood took a prominent part in public affairs. He represented the fifth ward in the town council from 1876 to 1887 and from 1891 to 1897, and was a magistrate from 1881 to 1884. He was also for several terms a member of the School Board, and he was a representative to the Educational Trust, of which he was for some time chairman. He was a Justice of the Peace for Ayrshire. Among the more important buildings he erected in the town were the Burns' Monument in the Kay Park, the Opera House (now converted into a church), the Dick Institute, and the new academy. Deceased is survived by a widow and family.

WE regret to have to record the death of Mr. THOMAS HUXLEY, the well-known builder, of Malpas, which took place at his residence, after an illness extending over three months. The deceased gentleman was in his 83rd year, and up to a comparatively recent period had enjoyed the most perfect health throughout a life of activity and hard work. He began life with the proverbial half-crown, and by dint of unremitting attention had built up an extensive business as a builder and contractor.

CHIPS.

The corporation of Liverpool have agreed to build a new hospital for infectious diseases at Fazakerley at a limited cost of £121,457, in addition to £10,000 for the land and £5,000 for the furniture.

Property of the value of £10,852 17s. 8d. has been left by Mr. Henry Francis Storey, M.Inst.C.E., of 6, Albert-road, Clifton, formerly of the Indian Public Works Department, who died on June 18 last.

The memorial-stone of the new United Free Church at Low-water, Hamilton, was laid on Saturday by the Duke of Hamilton. The church is of simple Gothic design, and is estimated to cost £2,400.

Mr. Thomas Hughes, architect and builder, late of Hockley, near Birmingham, died on Sunday last at Stamford-road, Huddersworth, aged 62 years.

A Parliamentary paper just issued shows that the total amount of advances made to occupying tenants in Ireland (exclusive of tenants of glebe land) since the passing of the Irish Land Act of 1870 up to March 31 last was £23,034,538, of which £9,932,533 was advanced under Acts relating to land-purchase passed in the years 1885-83, and £12,133,635 under such Acts passed in 1891-96. The total amount of principal repaid in respect of such advances during the whole period was £2,160,059.

The choir of Bangor Cathedral, which has been completely renovated at the expense of Lord Enniskerry (estimated at £600), will be reopened on Sunday, September 3.

The names of Mr. G. H. Jones, building material merchant, of The Avenue, Broughton, and of Mr. Messrs Higson, decorator and plasterer, Pendleton, have been added to the commission of the peace for Cheshire. Both gentlemen are members of the town council.

The Ramsgate Royal Sailors' Rest and Bath will be completed about October next. The cost will be some £3,000.

Building Intelligence.

BRISTOL.—New baths in Maze-street, Barton Hill, Bristol, were opened on Monday. The exterior is plain, but the internal arrangements are very complete. The swimming-bath is 75ft. by 30ft. There are 36 slipper baths. The boiler-house is provided with tanks for the storage of about 9,000 gallons of water, and a separate cold water storage tank is also provided for Kane's Baths. The establishment laundry is well equipped, and comprises one of Bradford's patent "sugar" washing machines, equal to washing, boiling, and rinsing 350 to 400 towels at one time. It has also boiling and rinsing tanks with hydro extractor, together with a suitable draw-out drying-closet and mangle. The engineering work, including that just mentioned, has been carried out by Messrs. Thomas Bradford and Co., of London, Manchester, and Liverpool. The building is lighted throughout by electricity, all the wiring and lights being in watertight tubes and fittings. The general contractor is Mr. A. J. Beaven, of Dean-lane, Bristol. The sketch plans for the establishment were designed by the city engineer, and approved by the Local Government Board, who sanctioned a loan for the land, buildings, and machinery. The working drawings, specifications, and superintendence of the erection of the buildings and engineering contract have been undertaken by Mr. W. S. Skinner, architect, of Edinburgh Chambers, Baldwin-street. The amount of contract for the building work is £13,680, and for engineering close on £3,000. Mr. James Hurn acted as clerk of the works. The building is equipped with fire hydrants and fire extinguishing apparatus.

IPSWICH.—The board of guardians have under consideration a report by the workhouse committee recommending the adoption of plans for additions to the new workhouse in St. John's, prepared by Mr. Frank Brown, of Ipswich. They include the enlargement of the laundry, the provision of additions to the receiving and tramps' wards, and the conversion of the former proposed bakery into officers' mess-room, with a clothes-store over it. Besides these, plans have been prepared by Mr. Brown for the addition of a pavilion on the women's side, extending from about 7ft. from the married couples' quarters to the shelter in the children's yard. This would provide dayroom accommodation for an additional 60, and dormitory accommodation for an additional 50. This wing would be used for old women's quarters, and would be connected by a corridor with the present women's pavilion. The addition of a pavilion on the men's side, connected with the present men's pavilion by a corridor, capable of accommodating the 20 men who have slept in a room originally intended for a bakery, and 68 more in the dormitories, and 93 more in the day-room. The estimated cost is over £10,000. In addition to these proposals, Mr. Hamlet Roberts, corporation waterworks engineer, has prepared a scheme for constructing an underground tank to hold 60,000 gallons of water for the better protection and supply of the workhouse. The board decided to ask the corporation "to erect a water tower for the district of St. John's, in which the union workhouse, St. John's Home, lunatic asylum, and fever hospital are situated, thus doing away with the necessity imposed on these four establishments of severally incurring a separate outlay of ratepayers' money in making good this serious defect." The request was received by the town council at their meeting on Wednesday, and was referred to a committee to report upon.

LANGLEY MOOR, CO. DURHAM.—The new St. Patrick's (R.C.) mixed schools at Langley Moor have now been opened. They give accommodation for 337 children, and have been erected at a total cost of £1,691, being at the rate of £5 10s. per head. Mr. Jos. Robson, of Waterhouses, was the builder, and they have been erected from the designs, and under the superintendence, of Mr. H. T. Graddon, A.R.C.B.A., of Durham.

MANCHESTER.—An important improvement now in progress is the clearance of the great goods storage premises at the corner of Anburn-street and Piccadilly, in the occupation of the well-known carrying firm of Thompson, McKay, and Company. The new building, of which Messrs. Charles Heathcote and Sons, of Cross-street, Manchester, are the architects, promises to be a striking addition to the street architecture of the locality. It is to be of deep red brick and buff

terracotta. The site has an area of nearly 900 square yards, of which some 200 square yards cross the Rochdale Canal, which at this point passes beneath Piccadilly at the foot of the approach to London-road Station. The canal is spanned by two arches, and upon these rest the storage premises rising to a height of eight stories and seven windows long.

NORFOLK.—The new buildings at the Norfolk County Asylum will be opened on September 17 next, just 93½ years from the time that a number of county magistrates selected the plans of Mr. William Brown, architect and surveyor, of Ipswich, from among eighteen others, for the erection of a building for the reception "of the miserable subjects of this institution." Mr. Brown's plans were fully carried out by May, 1814, when the asylum was opened for the reception of forty male patients. A premium of 70 guineas was paid for Mr. Brown's plans; but the amount paid to the contractors for the building that was put up from them is not easily to be ascertained, nor can so much as the names of the builders be traced. Many additions have since been made. The enlargements and alterations now nearing completion have cost £70,000, and, except as regards a chapel, a recreation hall, and a laundry, the annexe is now a complete asylum in itself. The scheme which is just nearing completion adds another 150 beds to the accommodation. Mr. A. J. Woods, of London, is the architect; Messrs. King, of Vauxhall Bridge-road, are the builders.

SOUTHAMPTON.—The foundation-stone of the new Corn Market, Southampton, was laid on Thursday week. The building, which will be 52ft. long by 32ft. wide, is being erected by Mr. Wm. Ward, contractor, 113, Avenue-road, to the plans of Mr. Crowther, borough engineer. It will be a one-story building of red and white brick, with carved keystone, and with carvings of shepherd's crooks and sheaves of corn, the stonework being done by Messrs. Garrett and Haysom.

Engineering Notes.

CRYSTAL PALACE SCHOOL OF ENGINEERING.—Sir Fortescue Flannery, M.P., presided last Friday at the award of certificates to the successful students of this school on the close of the summer term. The meeting was held in the lecture theatre of the school at the Palace, and among those present were Mr. J. W. Wilson, principal; Mr. Maurice Wilson, vice-principal; Mr. Botham, assistant manager, Crystal Palace Company; Mr. J. Braston, and the three examiners, who were old students of the school. The vice-principal read the names of the students who had gained certificates, T. O. Pepper obtaining the highest number of marks, 262 out of a possible 272, for the first year's course in mechanical engineering. The following won first places:—Drawing office, A. R. Hodgson-Stevens; pattern shop, J. M. S. Culbertson; fitting shop, T. O. Pepper. Second year's course, civil engineering, first term, A. Maude; second term, E. Schneider; third term, D. R. Allen. Electrical Section: First term, lecture examination, C. T. Richardson and F. C. Wright bracketed; second term, lecture examination, A. H. Drummond; drawing and fitting, F. H. A. Thoday. A certificate of honour was granted to D. R. Allen for having obtained six certificates out of a possible nine, none lower than third in order of merit.

Messrs. Bruce Peebles and Co., Ltd., of Tay Work, Benington, have secured the contract for the construction of the new electric railway being promoted by the North Wales Power and Traction Co., Ltd. The scheme is for the harnessing of the immense watershed comprised in the lakes of Snowdon. The initial contract, amounting to £150,000, will supply approximately 10,000 H.P., and includes about thirteen miles of electric railway, constructed on the Ganz high-tension system. The line will pass through some of the finest scenery in North Wales.

Mr. G. J. Perram, secretary to the Public Works Department, Assam, has been appointed superintending engineer for irrigation, Hyderabad State, on Rs.1,200 per mensem.

The new parish church at Shettleston, Glasgow, was opened on Sunday for public worship. Built from plans prepared by Mr. William F. McGibbon, architect, Glasgow, the church is of the 13th century French Gothic style, and is seated for 1,050 persons. An organ has been provided.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—D. C. Q.—L. M. and Co.—E. J. D., Ltd.—R. H. and Son.—J. B.—R. R.—A. W.

R. B. WITTEN.—Certainly the Urban District Council can do so.

Correspondence.

AN APPEAL BY THE A.A.

To the Editor of the BUILDING NEWS.

SIR,—The Architectural Association has now acquired possession of the Royal Architectural Museum in Tufon-street, Westminster, and has obtained from the Ecclesiastical Commissioners a new lease for 999 years on most advantageous terms.

A contract with Messrs. Holloway Brothers for the necessary reconstruction to suit our requirements has been entered into, the amount of which is £8,440. This expenditure is a considerable one, but the committee has felt that it is bound to make adequate provision for future requirements. Donations and promises have been received amounting to about £1,500, leaving a balance of £5,000 still required to meet the building contract, furnishing, and equipment.

In view of the importance of the work of the

A.A. to the profession generally, I venture to appeal through your columns for further donations to assist us in meeting our liabilities. It is earnestly hoped that we may be able to enter our new premises free from debt.—I am, &c.,

HENRY T. HARE, President.

The Architectural Association, 56, Great Marlborough-street, London, W., August 10.

QUANTITY SURVEYORS' CHARGES.

SIR,—I notice on page 159 that you comment on the offer made by professional men to prepare bills of quantities for public bodies. This has arisen from these causes:—

1. Besides regular quantity surveyors who have been trained in surveyors' offices, or have been in architects' offices, where all branches are carried on, this branch of the profession, like the strictly architectural branch, is recruited from those who have not succeeded as builders, and these men are appointed by public bodies to undertake work at less than the ordinary charges.

2. Public bodies are most careful to insure in their contract that the workmen shall be paid the full rate of wages, no matter what his qualifications may be, but will cut the professional man down to the lowest penny. I have known a commission as low as 10s. per cent. paid by public bodies for quantities of intricate buildings. The quantity surveyors to the School Board for London cannot make anything out of alteration jobs, and not much out of new buildings.

3. All branches of the profession are so overcrowded that surveyors are anxious to get work, either by tendering low or by offering a good portion of their ordinary commission to the architect introducing the work, and, again, architects in the struggle for work are glad to receive part of the surveyor's commission, as they have in many cases to pay some kind of honorarium to the person introducing work to them.

I do not see that the Surveyors' Institution can do anything, and things are daily growing worse.—I am, &c.,

FAIR PAY.

DOL CATHEDRAL.

SIR,—The square compartments shown in Mr. Weatherley's sketch are plaster of Paris copies of the originals. These were smashed up about four years ago, when I saw them lying at the side of the road. Both sides of the porch possessed panelling, which is, I think, rather a rare feature, but it is now gone—more's the pity. The carving under the arch to the porch is also a plaster copy of the original.—I am, &c.,

ANDREW OLIVER.

5, Queen's-gardens, W.

Intercommunication.

QUESTIONS.

[11998].—Contractors' Claim.—A contract for work amounting to £500 is let and duly signed; the contractor commences work, and does £50 worth. Owing to dispute between proprietor and local authority, the work is finally stopped. What amount is the contractor entitled to claim?—HALIFAX.

[11997].—Wood-Block Floor Smelling.—A wood-block drawing-room floor, formed of oak and teak blocks alternately, emits a very strong odour when room has been shut up for a few hours, or floor been recently scrubbed—due, I take it, either to the oil in teak or galle acid in oak—perhaps both. Could any reader advise practical and effectual remedy?—CAN-CAN.

REPLIES.

[11998].—Payment of Architect.—"W. A." should not give up any of the papers until his charges are paid, especially as the client appears to be short of money.—H. L.

[11994].—Shifting River.—Dredge or form a culvert to some suitable point.—H. L.

[11995].—Tree and Foundations.—There would be no risk if the house foundations were of sufficient depth.—H. L.

At the last meeting of the London County Council a resolution was passed appointing Messrs. J. Rider Hunt and Co., Bridge House, 181, Queen Victoria-street, London, E.C., one of the quantity surveyors to both the architect's and engineer's departments, which has hitherto been held by separate firms of surveyors, and is consequently a unique position.

New cottage homes for the school children of the Medway Union have just been built in Maidstone-road, Chatham, and were opened on Friday. Mr. G. E. Bond, of Rochester, was the architect, and Alderman Skinner, of Chatham, the contractor. The cost has been £20,000.

PARLIAMENTARY NOTES.

THE ARCHITECT TO THE BOARD OF EDUCATION.—Mr. Lambert asked the Secretary to the Board of Education on Tuesday what length of time Mr. Robson had served as consulting architect to the Board of Education, whether he had received notice that his services would be terminated on September 30, was such notice due to his incompetence, if not, what was the reason for it, and whether, in view of appeals permitted by the Education Act to be made by the denominational managers to the Board of Education, he would take steps to secure that the highest expert assistance should continue to be at service of the Board? Sir W. Anson: Mr. Robson has been engaged for 18½ years as consulting architect to the Board of Education. His engagement will terminate on September 30. No question of the competency of Mr. Robson is involved. The Board of Education are making new arrangements to meet new conditions, and will, of course, take care that they are properly provided with expert assistance in the matters to which the question refers.

HOUSING OF THE WORKING CLASSES (No. 2) BILL.—This measure passed through committee of the House of Commons on Monday, clause 12 (advances for purchase of ownership of dwelling-house) and 13 (sale of lodging-house) being struck out. On the consideration of the Bill as amended, Mr. Long moved, on Tuesday, various drafting amendments which were agreed to. Sir W. Foster said this Bill went some way towards making it possible for local authorities in town districts to provide buildings for people who were driven to reside outside towns; but there were a large number of other subjects to be dealt with before they could consider that adequate and sufficient powers were given to the local authorities to deal with the serious conditions that existed in our large towns and rural districts. Sir A. Rolit, Mr. C. Hay (Shoreditch, Hoxton), and Mr. P. Thornton (Clapham) congratulated the Government on the advances made by the Bill. The Bill was read a third time.

WORKMEN'S COMPENSATION, AND THE 30FT. LIMIT OF HEIGHT IN BUILDINGS.—Sir C. Cayzer asked the President of the Board of Trade, on Tuesday, whether his attention had been directed to accidents to workmen in or near buildings less than 30ft. in height for which, under the Employers' Liability Act, they or their families were not entitled to compensation in case of injury or death, and to the fact that at Leeds lately a working painter fell 28ft. 6in., and was killed, and his family received no compensation because the building was not 30ft. high; and, if so, whether he could see his way to introduce legislation to amend the Act. The Home Secretary: I presume that the hon. member intends to refer to the Workmen's Compensation Act, 1897, as there is no 30ft. limit with reference to the provisions of the Employers' Liability Act. I am aware that under this limit, as fixed by the former Act in regard to accidents in the course of building operations, cases such as that mentioned in the question must occur, and it has been stated more than once by myself and my predecessors that this is a point which must receive attention in connection with the Amendment of the Act which this Government have under consideration.

CHIPS.

The quantity of timber exported from Norway in 1902 was 1,961,725 cubic metres. This compared with 1,805,224 cubic metres in 1901, and 2,002,243 cubic metres in 1900. In 1901 the value of Norwegian timber coming to this country was £1,187,200.

Messrs. Wm. Potts and Son, clock manufacturers, Leeds, have received instructions to make and fix a new four-dialled illuminated striking clock and bell, from Lord Grimthorpe's designs, at the Yorkshire Inebriates' Home, Cattel, near York, which is now in progress.

The exhibition of arts and crafts by members of the Northern Art Workers' Guild was opened on Saturday at the Municipal School of Technology, Manchester, and will remain open until August 29. Admission free from ten to nine daily.

At Thursday week's meeting of the Blaydon and Whickham Council these authorities affixed their seal to a contract with Messrs. D. Rowell and Co., of London, for the erection of a suspension bridge, to be placed over the Derwent at Swallow in place of the present Sands Bridge, at a cost of £160.

Mr. L. E. Ward, chairman of the Tottenham District Council, presided at the opening of Down Hills Park—26 acres of land in the centre of the district. One-third has been laid out as gardens and the remainder as a recreation ground, and it has been acquired at a cost of £31,150, of which the Middlesex County Council contributed £5,300. It adjoins the estate on which the London County Council intends to build dwellings for 40,000 persons. Before declaring the park open Mr. Ward laid the foundation-stone of a dust destructor, which will cost £27,000.

LEGAL INTELLIGENCE.

THE POPLAR DOCK ARBITRATION.—At the Sheriff's Court on Tuesday, before Mr. Under-Sheriff Burchell, the hearing was resumed of the claim by the London and India Dock Company against the North London Railway Company for £140,000. The claim is in respect of a small piece of land with a quay frontage to the Blackwall Basin, which has been taken under Parliamentary powers by the North London Railway Company for the purpose of widening their locks and entrance from the Blackwall Basin to the Poplar Dock, of which latter the railway company are the lessees of the claimants for a term of 999 years. The claim is in the major part for damage consequent upon the recent action of the railway company in their widening, rather than for the actual value of the land. Sir Ralph Littler, K.C., for the railway company asked that his clients might be supplied with plans showing the exact nature and area of the land which would have to be taken for building the new entrance to Blackwall Basin from the river which the claimants had stated would be necessary in consequence of the railway company's action. Sir Edward Clarke having agreed to this, evidence was called on the railway company's behalf, and the case was again adjourned till Wednesday, when after hearing the summing up by the Under-Sheriff, the jury found for the claimants for the sum of £5,575.

CHALK RIGHTS AND CEMENT MANUFACTURERS.—(House of Lords, before the Lord Chancellor, Lord Macnaghten, Lord Shand, Lord Robertson, and Lord Lindley.)—*Tolhurst v. Associated Portland Cement Manufacturers (1900) (Limited) and Others.*—These were consolidated appeals from orders of the Court of Appeal (the Master of the Rolls, the President of the Probate Division, and Lord Justice Cozens-Hardy), dated August 12, 1902, which reversed the decision of Mr. Justice Mathew in the Commercial Court, dated June 12, 1901. The arguments were heard on July 7 and 13 last, Mr. Pickford, K.C., and Mr. George Wallis appearing for the appellant; and Mr. Younger, K.C., Mr. Bremner, and Mr. A. G. Wright for the respondents. The question depended on the true meaning and effect of a certain contract dated January 5, 1898, and made between Alfred Tolhurst, of the one part, and the Imperial Portland Cement Co., Ltd. The facts are stated in Lord Macnaghten's judgment. The Lord Chancellor last Friday said he was inclined during the argument in favour of the appellant, but had with some hesitation come to agree with the judgments about to be delivered. Lord Macnaghten: The question, as it seems to me, depends simply and solely on the true meaning and effect of the contract of January 5, 1898, made between Alfred Tolhurst of the one part, and the Imperial Portland Cement Co., Ltd., of the other. Two alternative constructions have been proposed. One follows the letter of the instrument and adheres to it closely; the other favours a more liberal interpretation, supplying, it is said, nothing more than what is required in order to carry out the obvious intention of the parties. The question is, Which of these two constructions is to be adopted? When that matter is once determined there cannot, I think, be any further difficulty. There are contracts, of course, which are not to be performed vicariously, to use an expression of Lord Justice Knight Bruce. There may be an element of personal skill or an element of personal confidence to which, for the purposes of the contract, a stranger cannot make any pretensions. But no one, I suppose, would seriously argue that a contract for delivery of chalk from particular quarries for the use of particular cement works cannot be performed by any person for the time being possessed of the quarries, or that it can make the slightest difference to anybody who the proprietors of the cement works or the actual manufacturers may be, provided they are in a position to carry out the terms of the original contract. Tolhurst was the owner of property at Northfleet, in Kent, containing extensive and valuable chalk quarries. He sold a piece of his land there known as the Little Dockyard to the Imperial Co., and that company bought another piece of land from the British White Lead Co., who also derived title from Tolhurst. The main object for which the Imperial Co. was formed was to establish cement works at Northfleet, and carry on there the business of Portland cement manufacturers. It was, of course, important for Tolhurst to secure a regular market for his chalk, and it was equally important for the Imperial Co. to secure a regular supply of chalk for their works. The effect of the contract of January, 1898, may be stated shortly. Tolhurst made a tramway to the boundary of the land bought by the Imperial Co. from the White Lead Co., and the Imperial Co. was to make a tramway outturning Tolhurst's tramway to a convenient spot in its land in order to enable him to bring chalk to the company's works. On completion of this tramway the contract provides that "the said Alfred Tolhurst, for a term of 50 years, to be computed from the 25th day of December, 1897, or for such shorter period (not being less than 35 years) as he shall be possessed of chalk available and suitable for the

manufacture of Portland cement, and capable of being quarried and got in the usual manner above water level, supply to the company, and the company will take and buy of the said Alfred Tolhurst at least 750 tons per week, and so much more, if any, as the company shall require for the whole of their manufacture of Portland cement upon their said land." Tolhurst was to provide rolling stock and traction power, carry the chalk over the company's tramway, and deliver it alongside the company's stores, but he was not to be precluded from supplying other persons. Delivery orders were to be sent in before 4 o'clock for the next day. The price was to be 1s. 3d. per ton, to be paid in cash monthly. The average monthly payment for any year after 1898 was to be not less than £188. Then there was a clause providing for the case of strikes and unavoidable stoppages, and authorising the company at its own expense to procure chalk elsewhere in the event of Tolhurst being thereby prevented from supplying the quantity required. In 1900 the Imperial Co. sold its undertaking to the respondents, the Associated Co., and went into voluntary liquidation. Its affairs were fully wound up, and all its assets have been distributed. Tolhurst brought in no claim in the liquidation. He stood by while the Imperial Co. was in process of dissolution. Tolhurst's case now is that by parting with its undertaking and going into liquidation the Imperial Co. rescinded or put an end to the contract of January, 1898, and that he is not bound under or in accordance with that contract to furnish supplies of chalk to the associated company for the purposes of the works at Northfleet which formerly belonged to the Imperial Co., whether the Associated Co. requires delivery in its own name or in the name of the Imperial Co. Now, what is the meaning of the contract of January, 1898? I cannot think there is much difficulty about it. It is expressed to be made between Alfred Tolhurst and the Imperial Co. They, and they only, are named as the persons to perform the contract. From beginning to end of the instrument, if the contract be taken literally, there is not one word pointing to the continued existence of the contract in the hands of any other person either by succession or substitution. The obligations and benefits of the contract on the one side begin and end with Alfred Tolhurst; on the other, they begin and end with the Imperial Co. And yet the contract is to endure for a period of 50 years, or if the supply of chalk in the quarries does not hold out so long, it is to last for 35 years at least. Now, when it is borne in mind that the Imperial Co. must have been induced to establish its works at Northfleet by the prospect of the advantages flowing from immediate connection with Tolhurst's quarries, and that the contract in substance amounts to a contract for the sale of all the chalk in those quarries by periodical deliveries (less what Tolhurst might sell elsewhere), it is plain that it could not have been within the contemplation of the parties that the company would lose the benefit of the contract if anything happened to Tolhurst, or that Tolhurst would lose the benefit of the market which the contract provided for him at his very door in the event of the company parting with the undertaking, as it was authorised to do by its memorandum. Mr. Pickford said, and said truly, that those powers in the memorandum to which his attention was called placed the company in the position of an individual. That is so. But if the contract had been between two individuals—between Alfred Tolhurst and John Smith—I do not think there would have been any doubt about the matter. It is, I think, the introduction of a company—a body with perpetual succession, defined capital, and specified objects—as one party to the contract, that really creates or suggests the difficulty—that and the use of the word "their"—"their manufacture," "upon their land." But the word "their" in the case of the company must not be taken too literally any more than the word "his" in the case of Tolhurst where the contract speaks of "his" land. Something more is comprehended than the particular company and the individual Tolhurst. It seems to me that the contract is to be read and construed as if it contained an interpretation clause saying that the expression "Tolhurst" should include Tolhurst and his heirs, executors, administrators, and assigns, owners and occupiers of the Northfleet quarries, that the expression "company" should include the company and its successors and assigns, owners and occupiers of the Northfleet Cement Works, and that the words "his" and "their" should have a corresponding meaning. That, I think, was the plain intention of the parties. The contract is a contract for the mutual benefit and accommodation of the chalk quarries and the cement works, and of Tolhurst and the company as the owners and occupiers of those two properties. Construed fairly, the provision in Clause 2, about which there was so much argument, means, I think, nothing more than this—that the Imperial Company was to take the whole of the supply of chalk required for the Northfleet works (the quantity to be ascertained by daily orders, but guaranteed not to be less than 750 tons per

week) from Tolhurst's chalk quarries and from no other source whatever. As long as that is done, how can it matter who is carrying on the works? There is nothing in the contract to restrict the development of the works on the land which formerly belonged to the Imperial Company or to check the expansion and improvement in the ordinary course of things of the process of manufacture there. If the view I have expressed be correct, all difficulty vanishes. It is well settled that as a general rule the benefit of a contract is assignable in equity and may be enforced by the assignee. The assignor ought in ordinary circumstances to be made a party. But I cannot think that this is necessary when the assignor is a mere name, as the Imperial Company is in the present case, without any means and without any executive or board of directors, if indeed it has now any corporate existence. I am not aware of any authority for this proposition, but it seems to me to be in accordance with the practice in equity, and it is supported by what was said by James, V.C., in "*Castellan v. Hobson*" (10 Eq. 47). The result is that Tolhurst's action fails, because, as regards the chalk which has been supplied to the Associated Company, the company is entitled to have it at a stipulated price of 1s. 3d. per ton. The second action succeeds, but I think the Imperial Company was not a necessary or proper party. If the requirements of sections 142 and 143 of the Companies Act, 1862, have been complied with the company is "deemed to be dissolved," and therefore I should suggest that in lieu of the declaration in the order pronounced by the Court of Appeal there should be inserted a declaration to the effect that the Associated Company is entitled to the benefit of the contract of Jan. 5, 1898, they paying, as provided by the contract, for all chalk supplied to them in accordance with the contract. With this variation, I think the orders under appeal should be affirmed, and the appeal dismissed with costs. Lord Shand, who is unable to be present to-day, has asked me to express his concurrence in this opinion. Lord Robertson: I can explain in a few sentences what I find an insuperable objection to the judgment appealed against. It seems to me that the demand of the respondents is that the appellant should supply them with something different to that which he bound himself to give. The subject-matter of the contract is expressed to be the supply of 750 tons, and so much more chalk, if any, as should be required for the business of a particular company, while the demand of the respondents is that the appellant shall supply 750 tons and so much more chalk as is required for the business of another and a different company. The appellant's point is, therefore, not the bare one that the contract is not transmissible, but it is that the thing which the assign is asking for is something which the appellant never bound himself to give. Now, first of all, about the facts. It is true, or at least I assume it to be true, that the original company still exists in such sense that it can sue. But it is still more certain that it has finally ceased business; and it exists and comes into Court solely in order to enforce this contract (if it can) in favour of the new company. And the crucial fact (in my view) is that the original company is, as a manufacturer, dead and done with, and has no requirements large or small. The requirements which the appellant is now called on to meet are not the requirements of the old company, but the requirements of the new. It seems to me to be no answer to this to say that the old company might have increased its capital and its operations, so that its requirements would have been as onerous as those of the new company. This is merely the old and often rejected argument that a man can be forced to do something which he never agreed to, merely because it is very like and no more onerous than something which he did agree to. I have only to add that I should find it impossible to split up the subject of the contract, and to hold that, even if the appellant is not bound to meet the requirements of the new company, he is bound to give them the 750 tons. In a commercial contract like this the benefit of the more elastic provisions belongs to both parties, and neither the person who supplies nor the person who takes can be held to the one part of the contract when the opposite party has by his own act rendered the other part of the contract impossible of fulfilment." Lord Lindley: In January, 1898, Mr. Tolhurst, who was the owner of some chalk land in Northfleet, sold part of that land to the Imperial Portland Cement Co., and by an agreement dated Jan. 5, 1898, he agreed that they should have, for fifty years, from his adjoining chalk quarries, all such chalk as they should require for their cement works on the land they had bought. They were to pay 1s. 3d. a ton for all they wanted, and they bound themselves to take at least 750 tons a week. The company were not to come on to Tolhurst's land and get the chalk themselves. He was to get it and deliver it to them, and they were to pay him monthly for what was so delivered. Mr. Tolhurst was at liberty to sell chalk to other persons, and provision was made for the possible event of all his chalk being worked out before the expiration of the fifty years. The nature of the agreement and the time it was to last negated the

idea that it was confined to the parties to it. The word "assigns" does not occur in the agreement. But this does not show that the benefit of the contract is not assignable. An agreement for a lease, and even an option to require a lease or a renewal of a lease is assignable in equity, even although there is no mention of executors, administrators, or assigns. See "Backland v. Papillon" (L.R., E.J. 47, and 12 Ch. 67). My lords, if the above agreement had been with an ordinary individual his interest would, on his death, have passed to his executors or administrators; or if he had become bankrupt his trustees could have claimed it, and have sold it for the benefit of his creditors. It follows that on the same supposition he could have assigned such interest in his lifetime. The Imperial Co. could, in my opinion, have done the same thing; they could have assigned their interest themselves before winding-up proceedings commenced, and their liquidators could have assigned it as part of their assets afterwards. But it is necessary to look a little further and see what limit is set to the right conferred by the agreement. The Imperial Co. were not entitled to an unlimited supply of chalk, but only to so much as they might want for making cement or their own piece of land. I do not think their right to have chalk from Tolhurst's quarries could be assigned apart from their own land and cement works. The Imperial Co. could not by alienation or otherwise increase the burdens which Mr. Tolhurst undertook to bear. But this is the only limit which I can find in the present case. Mr. Justice Mathew thought that the mere fact that the Imperial Co. was a comparatively small company, and that the Associated Company was much larger, and would, or might, want more chalk than the other, involved a material increase in the burden thrown on Mr. Tolhurst. But the learned Judge apparently overlooked the fact that the Imperial Co. could have increased its capital to any extent; and could have increased its cement works to any extent which the land they had bought from Mr. Tolhurst could carry. The limit of the burden thrown on Mr. Tolhurst is in any case measured by this consideration, and this limit can no more be passed by the Associated Co. than by the Imperial Co. But then Mr. Peckford, in his very able argument, relied on the words "as the company shall require for the whole of their manufacture of Portland cement upon their said land." But throwing a strong emphasis on the words "the company" and "their," the impression may be produced that these words, which plainly refer to the Imperial Co., were purposely used to exclude all other persons. But I cannot think that these expressions indicate any such intention. There is no question here of any personal confidence or personal skill. There is no reason whatever for supposing that any personal element entered into the mind of either of the parties to the agreement, and I cannot find anything in it to prevent the Imperial Co. from assigning the benefit of it to any other company or to any individual. By so assigning it the Imperial Co. would not get rid of their obligations to Mr. Tolhurst; but the contract is one the benefit of which is assignable in equity quite independently of the Judicature Acts. The Judicature Act, 1873, section 25, clause 6, has not made contracts assignable which were not assignable in equity before, but it has enabled assigns of assignable contracts to sue upon them in their own names without joining the assignor. I cannot agree with the Court of Appeal in thinking that the Associated Co. could not sue Mr. Tolhurst on this contract without joining the Imperial Co. as co-plaintiffs. The supposed necessity of making them parties or of postponing their dissolution to enable the Associated Co. to sue as their assignees has, I think, obscured the true position of this parties. I see no such necessity. But the joinder of the Imperial Co., although unnecessary, has not increased the costs, and need not be further noticed. If Mr. Tolhurst has any provable claim against the Imperial Co., and if he is not too late, he can prove against it, and the liquidators can, if necessary, obtain the means of paying him from the Associated Co. under their indemnity. In conclusion, I will only add that the "British Waggon Co. v. Lea" (5 Q.B.D. 143) was, in my opinion, rightly decided, and is an authority very much in point for the Associated Co. The contract there was held assignable, although the word "assigns" did not occur. The appeal fails, and the order of the Court of Appeal should be affirmed with costs; but the formal order of the Court of Appeal will, I think, be improved if amended as suggested by Lord Macnaghten.

FACULTIES FOR STAINED-GLASS WINDOWS.—At Cranbrook, on Wednesday week, before Dr. Tristram, Commissary-General of the diocese of Canterbury, an application was heard for a confirmatory faculty, authorising the erection of the east window in Cranbrook parish church, which was set up in 1861 by Mr. Robert Lucas Tooth. The petition was opposed by the Vicar (the Rev. William Bell) and many parishioners. The window was erected without a faculty by Mr. Tooth, who had been for seventy years a parishioner of Cranbrook. In May, 1902, the Vicar stated to the vestry that something

must be done to the east window, which was out of repair. Mr. Robert Lucas Tooth, who resides at Grendon Park, Loughborough, Leicestershire, a grandson of the donor of the window, fearing that the window was going to be interfered with, presented a petition for a confirmatory faculty in September last; but the Vicar insisted upon his giving a new window, as the existing window was out of repair, and was wanting in artistic merit. Mr. Tooth offered to repair the window, but the offer was refused. The opponents, who included Lord Cranbrook and Lord Medway, did not ask for a removal faculty, or make any offer of a new window, and did not object to the east window being a memorial to the Tooth family, who were highly respected in the parish; but resisted the faculty on the ground that the window was defective in design and colour, and that a faculty might prejudice the chance of obtaining a more artistic window for the east end of the church. Mr. F. D. Hardy, artist, and resident in Cranbrook for fifty years, opposed on the ground that the window was wanting in grandeur of design, and the glass was inferior. The window was similar to other windows in the chancel, and set up by the same artist, Mr. O'Connor, who had been selected by Mr. Webster, R.A. The Rev. W. Bell then put in a plan of the window showing the gradual decay and perishing of the glass. Mr. Hardy stated that Mr. Tooth's offer to repair being declined if the faculty were not granted, he was told Mr. Tooth would not execute the repairs. The Commissary-General said he had never in his experience known a similar case. The lay rectors, who were the Dean and Chapter of Canterbury, were primarily liable for the repair of the chancel. If a new window was erected the inscription at the base must remain, as it was a memorial to the Tooth family. He would adjourn the case till Easter to see what the parish could do; and if the faculty was granted it would be upon terms.

IN RE JOHN HOWARD.—A first meeting of the creditors of Mr. John Howard, builders' merchant, 432 and 433, Kingsland-road, N.E., took place on Monday, under a receiving order made on July 17 last, on the debtor's own petition. The debtor states that he filed his petition in consequence of the lock-up of his capital in buildings which could not at present be realised. A draft statement of affairs was produced showing gross liabilities amounting to £17,973, of which £11,731 was expected to rank, and a deficiency of £6,315. It was resolved that the matter should be wound up in bankruptcy by Mr. R. J. Ward, chartered accountant, as trustee, with the assistance of a committee of inspection.

A LONG-ACRE ARBITRATION.—In the Westminster High Bailiff's Court, on Monday, Mr. John Troutbeck and a special jury had before them the case of "Sergeant v. The Great Northern, Piccadilly, and Brompton Railway Company." It was a claim by Mr. Arthur Sergeant, a baker, carrying on business in Long-acre, for compensation for the compulsory acquisition of his leasehold interest in his premises, which are required for the purposes of the new Covent Garden Station, the lease being 20 years unexpired. By an agreement arrived at between counsel, the plaintiff agreed to accept a verdict for £1,750, remaining in possession for two months as from last Friday, and taking away all the fixtures and the fittings, which were to remain his property. By direction of the high bailiff the jury returned a verdict in the terms stated.

A new Primitive Methodist church was opened at Oulton, near Lowestoft, last week. It has been built from plans by Mr. F. W. Richards, M.S.A., of Lowestoft. The new edifice is 40ft. long and 25ft. wide inside, and 14ft. high at the plate, and 21ft. from floor to ceiling at the collar level. It has an open roof, with principals. The building is ventilated with Messrs. Boyle's roof ventilators, and also by wall fresh-air inlet tubes, and lighted on both sides and at the front. The building is faced with red bricks, and the front is relieved with white Chertsey ware dressings. The contract has been carried out by Mr. J. S. Younge, builder, of Oulton Broad, and the cost has been £700.

There is renewed probability that the Theatre Royal, Birmingham, will be rebuilt. Messrs. Ernest Runtz and Co., the architects of the new Gaiety Theatre, have been entrusted with the preparation of the plans, and of the row of shops fronting upon New-street, which will be in a style of architecture consonant with that of the playhouse, part of which will stand above the business premises.

In Winner-street, Paignton, last week, the memorial-stones were laid of new Baptist Sunday-schools. Messrs. Briggman and Bridgman are the architects, and the erection of the building has been entrusted to Mr. R. Harris.

The Primitive Methodists of Crowland have completed their building scheme. A commodious schoolroom, adjoining the chapel, with classrooms, vestries, and outbuildings, has been erected, at a cost of £350.

STATUES, MEMORIALS, &c.

CREWE.—The Crewe War Memorial was unveiled on Saturday. The monument has been executed by Messrs. J. Whitehead and Sons, of Westminster. It is of Aberdeen granite. Two steps on either side lead up to a square block with four panels in bronze, on which the officers' and men's names are inscribed who left the town of Crewe to do duty in South Africa. The monument tapers towards the top, and finishes with an Ionic capital on which stands a bronze figure of a soldier, with rifle, bandolier belt, pouch, and water bottle. On the front of the monument stands a model in bronze of the latest type of 7ft. four-wheeled-coupled compound engine designed by a Crewe workman, Mr. J. H. Lightfoot. The whole stands on a base 16ft. square, surrounded by a granite kerb with two full-sized lions on either side.

NEWPORT.—The unveiling of the Island memorial to Queen Victoria at Newport, Isle of Wight, took place yesterday, by Princess Henry of Battenberg. An address from the Memorial Committee was read by the chairman, and presented to the Princess. H.R.H. then unveiled the memorial, the architect (Mr. Percy G. Stone) handing H.R.H. a silken cord for the purpose. The memorial takes the form of a Victoria Cross on a tall, graceful column, the figures at the base representing the regal virtues of Dignity, Fortitude, and Sympathy upholding the crown, and guarded by the lions of England. We illustrated and fully described the cross in our issue of July 11, 1902.

PLYMOUTH.—Another war memorial was unveiled at Plymouth on Saturday. The canopied and moulded base of the obelisk, of green Swedish granite, weighs about seventeen tons, and contains bronze panels on each of the four sides of the monument each 4ft. 4in. wide and 3ft. 10in. high. The Prince Christian Victor panel is the work of Mr. Emil Fuchs. The Devon, Gloucester, and Inscription panels are by Mr. Onslow Whiting. The casting of all four panels is the work of Mr. Enrico Cantoni. Carved in granite on each side of the bronze panels are smaller panels containing names of the principal engagements in which the Prince Christian, the Gloucesters, Somersetshire, and Devon Regiments took part. The shaft or obelisk above the base is of red Swedish granite, ornamented with sunk polished plates and bands finely axed on all four sides, surmounted by the Greek honeysuckle ornament. The whole of the polished granite was worked in Aberdeen. The design is by Mr. F. W. Marks, architect, of London.

CHIPS.

The will, dated June 30, 1903, of Mr. Benjamin Ebenezer Nightingale, builder and contractor, of the Albert Works, Albert Embankment, who died on July 17, was proved on July 25 by Thomas Thompson and Frank Taylor, the executors, the value of the estate being £23,894.

The death occurred on the 8th inst. of the wife of Mr. R. Clarke Edwards, F.R.I.B.A., of 37, Norfolk-street, Strand, W.C. Mrs. Ada Edwards, who was 55 years of age, died on the 26th anniversary of their wedding day, at their residence, 55, Buckland-crescent, Hampstead.

The Paviers' Company is gradually, but none the less surely, going down hill as far as numbers are concerned. A year ago the strength of the Livery was nine, but now, as stated in last week's *City Press*, it is only eight. There can be but one end—the extinction of the Guild altogether, and the forfeiture of its charter—unless there is a speedy revival.

The new central premises of the Weights and Measures Department of Glasgow Corporation in Parnie-street, Glasgow, were opened last week. The new premises, which have been provided by the local authority, have been erected according to a plan prepared by Mr. A. B. Macdonald, city engineer.

The Heston Schools, Isleworth, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At a meeting of the Ludlow Town Council on Thursday, it was decided to make application to the Local Government Board for powers to borrow £8,250 for carrying out a scheme of electric lighting, and for the purpose of a refuse destructor. The scheme has been prepared by Mr. John Parker, Hereford, and the corporation has already consulted an expert upon the details, his opinion being entirely favourable. A new general district rate of 1s. 4d. in the pound was levied.

The new church of St. Mary the Virgin, Corsley Wilts, which has been erected and endowed by bequest of Mrs. Fletcher Barton, was dedicated by the Bishop of Salisbury on Thursday week. The cost of the building has been about £5,000. A choir of £5,000 has been left for endowment.

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NEW PREMISES, HOLBORN.—UPTON COTTAGE, SLOUGH.—DESIGN FOR LIVERPOOL CATHEDRAL.—PROPOSED CLERGY HOUSE.—R.L.B.A. PUGIN TRAVELLING STUDENTSHIP DRAWINGS.—HOLLINGTON HOUSE.—DESIGNS FOR A BAND STAND AND REFRESHMENT ROOM.

Our Illustrations.

NEW PREMISES, STAPLE INN, HOLBORN.

MESSRS. ALFRED WATERHOUSE, R.A., AND SON are the architects of this new block of offices, the ground floor of which is occupied by the bookshop of Mr. Bumpus. Adjoining is the famous range of timbered old houses forming the frontage to Holborn of Staple Inn. Mr. Waterhouse renovated these historic buildings a few years since with considerable care and good taste so as to preserve their ancient character. Our illustration is taken from a view made by Mr. C. W. English, who has offices in the building which forms the subject of this double-page plate. The work is in terracotta, and may be said to be typical of Messrs. Waterhouse and Son's designs.

UPTON COTTAGE, SLOUGH.

This house contains on the ground floor large hall, drawing-room, dining-room, morning-room, pantry, kitchen, scullery, storeroom, and knife and boot-room and usual offices. On the first floor five bedrooms, dressing-room, bathroom, h.m.c., and w.c.; on the second floor three bedrooms and two large storerooms, and one store-cupboard in roof. Externally the house is finished in roughcast, with a picked stock plinth. All roofs are covered with Hartshill sand-faced red tiles. The contract was let for £2,100 to Mr. James Carmichael, Wandsworth, London. The architect is Mr. W. H. Raffles, 10, Gray's Inn-square, W.C.

LIVERPOOL CATHEDRAL.

This is the concluding plate of our series of illustrations of Mr. Malcolm Stark's design for this church. During the last month or so we have printed most of his drawings, and those published herewith show sections of the nave and choir of the cathedral as proposed by this architect. Both details represent the church looking towards the high altar, the larger section showing the sides of the transepts and base of the flèche over the crossing. The previous plates of this design were given in the BUILDING NEWS for June 5, June 19, July 10 and 24, this year.

PROPOSED CLERGY HOUSE.

This drawing was recently exhibited at the Building Trades' Exhibition. It is intended to erect the clergy house, shown by the view and accompanying plan, in the West Central district. The materials proposed to be employed are yellow stock facings, with stone sparingly used, and plastered bays, the whole being very quiet in design, and effectively treated for a narrow street. Mr. Sidney B. Caulfield is the architect.

PUGIN TRAVELLING STUDENTSHIP DRAWINGS, R.L.B.A.

A WEEK or two since we gave a selection from Mr. C. Wontner Smith's studentship drawings, and we now give others. Fairford Church is princi-

pally remarkable for its fine stained glass, and it contains quite a number of really beautiful windows which are almost intact. This is accounted for by the fact that at the Reformation the glass was buried or hidden away, and only brought back when all danger of its destruction had passed. The church itself is of much interest, being chiefly in the Perpendicular style, and contains, amongst other features worthy of notice, some fine wooden screens and choir-stalls. Gloucestershire contains many old manor-houses dating from the 17th century, and although the one at Upper Swell does not compare with many in size and importance, yet it is a charming place. The work generally is simple in character, which is typical of the district. In one of the upper rooms there is an interesting fireplace with a projecting stone hood, carried on brackets and supported by pilasters. The hearth is composed of slabs of marble in squares, alternately black and white. Unfortunately, the whole of the overmantel has been treated with a coat of cream paint. In this room also is a fine modelled plaster ceiling and frieze.

HOLLINGTON HOUSE.

We much regret that, owing to the absence of the architect, Mr. Arthur Blomfield, we are unable to give particulars of this house to-day.

"BUILDING NEWS" DESIGNING CLUB: A BAND STAND AND TEA PAVILION.

(For description, awards, and further sketches, see pages 198-9.)

CHIPS.

The borough council of Hampstead have decided to spend £25,339 in extending the accommodation for the works department.

At a vestry meeting held in the Abbey Church vestry, Hexham, it was agreed that application be made to the Chancellor of the Diocese for a faculty to fill the northward window of the aisle of the south transept of the Abbey Church with painted glass as a memorial to the late Canon Barker.

The harbour board of Aberdeen, at a meeting on Monday, had under consideration a scheme for wharfing 800ft. of the north bank of the river Dee, from the eastern extremity of Point Law westwards to Ferry Place, at an estimated cost of £12,750, with the view of accommodating herring fishing vessels. The Board unanimously adopted the scheme, and a remit was made to the harbour engineer to report as to wharfing the remaining portion of the river east of Victoria Bridge.

A mission church of St. Stephen is about to be built at Seaton Delaval. The architect is Mr. C. S. Errington, of Grainger-street West, Newcastle.

The appointment of Mr. R. A. Chattock, at present electrical engineer to the Bradford Corporation, to the post of electrical engineer for the city of Birmingham, at a salary of £1,000 per annum, has been confirmed by the corporation of the latter city.

Last week the Bishop of Bath and Wells visited Lydeard St. Lawrence and dedicated the restored screen in the parish church. This ancient screen, which dates from the early years of the 14th century, has been restored to commemorate the Coronation of the King.

Sir Edward Fry, Sir Hugh Owen, and Sir John Wolfe Barry, the arbitrators under the Metropolitan Water Act, announce that the sitting of the Court on October 26 will be held in the hall of the Institution of Mechanical Engineers, Storey's-gate, Westminster.

Three German carpenters who were passengers by the *Gera* and were going out to New South Wales under contract to the Chillagoe Co., were not allowed to land on Tuesday, pending an inquiry as to whether they are skilled labourers within the meaning of the Act excluding unskilled labourers arriving under contract. On Wednesday Sir Edmund Barton allowed the three men to land at Melbourne, having satisfied himself that they possessed the special skill required, and that the restrictive clauses of the Act did not apply.

The Teddington Council, on Monday, received and accepted an offer of £1,000 from Mr. Carnegie to build a free library. It was decided that the present library premises should be given up, and a new library erected near the Council Offices on town property.

Several members of the London Geologists' Society, who are at present touring the country, visited the Fulwell quarries and the Claxhaugh Rock, near Sunderland, on Saturday, being conducted over the former by Mr. George Abbott, M.R.C.S., F.G.S., and at Claxhaugh by Mr. David Woolcott, M.Sc., F.G.S., of Sunderland.

COMPETITIONS.

ACTON.—The Middlesex County Council Education Committee, on behalf of the governors of the Acton County School, have decided to invite the following architects to prepare plans in a limited competition, the designs to be submitted by November next: Messrs. Maurice B. Adams, Clay, Giles Gough and Trollope, Pratt, Pywell, Osborne Smith, and A. H. Tiltman. The cost is to be about £8,000.

FLAMBOROUGH.—The competition for the best scheme for the local water supply has resulted in the adoption of the plans of Messrs. Elliott and Brown, of Nottingham. Fourteen schemes were submitted.

GLASGOW.—In the competition instituted by the corporation for designs for a branch free library for Bridgeton district, the successful architect is Mr. James R. Rhind, of Inverness.

GREAT HARWOOD.—The first place in the limited competition for new central co-operative stores, shops, and public hall, to cost £11,000, has been awarded to Mr. Fred J. Parkinson, architect, of 9, Richmond-terrace, Blackburn.

The new buildings erected at Furnace-road school, Muirkirk, N.B., at a cost of over £3,000, were formally opened on Monday by Mr. Baird, M.P.

New schools in Forsyth-road, West Jesmond, are about to be built for the Newcastle-on-Tyne school board from plans by Mr. Charles S. Errington, A.R.I.B.A., of that city.

The new dock built for the Government of Natal by Messrs. C. S. Swan and Hunter, Wallsend-on-Tyne, to replace the one lost on its passage to Durban about a year ago, was successfully launched on Saturday.

The cottage homes erected by the Newcastle-on-Tyne Board of Guardians at Ponteland will be opened on Sept. 10. Messrs. Oliver, Leeson, and Wood, of Newcastle, are the architects, and Messrs. E. Henderson and Son, of Ponteland, the contractors.

The memorial-stone of the new Nottingham Gordon Home for Boys, which is being erected in Cranmer-street, was laid with Masonic ceremonial on the 5th inst. by the Duke of Portland, K.G., Grand Master of the Nottingham Province. The home is being erected from plans by Mr. Ernest R. Sutton, of Bromley House, Nottingham. Mr. F. Essom is the builder.

A new place of worship, belonging to the Free Church of the Welsh, was inaugurated on Saturday in Cloughton-road, Birkenhead. It is built of brick in the Gothic style, with frontings of red Ruabon terracotta. The large hall has seating for 450 people, and attached are schoolroom, classrooms, and vestries. The electric light has been installed throughout. Including the land, the total cost is estimated at £3,000. The architect was Mr. T. Taliesin Rees, of Birkenhead.

In a large series of timber tests carried on at the University of Buenos Aires, the test pieces for the tensile tests were simple rectangular strips, 5cm. by 2cm. by 50cm., and the ends were held between the jaws of the testing-machine by means of wooden wedges. The wedges had a bearing on the test piece for a length of 12cm., thus leaving a free length of some 26cm., say 10in., at the middle of the test piece. All the specimens tested broke in this free length, and not under the wedges.

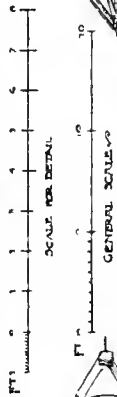
The new public baths in Maze-street, Barton Hill, Bristol, built at a cost of £17,000, were formally opened on Monday. The swimming-bath is 75ft. by 30ft., the water being 3ft. 6in. deep at one end and 6ft. 6in. deep at the other. A shower-bath and foot-baths are also provided, while there are 43 dressing-boxes. A specially-designed water-chute can be readily removed or simply raised when swimming competitions are on. A gallery for spectators is provided over the dressing-boxes, giving 250 seats. In the winter time the swimming-bath will be converted into a public hall by flooring over the bath at gangway level.

An inquiry was recently held at Tenterden by Colonel G. F. O. Boughey, R.E., C.S.I., and Mr. Henry Allan Steward (Light Railway Commissioners), into an application for an extension of time for making the suggested line to Cranbrook, for the diversion of certain footpaths adjoining Tenterden Station, and for the substitution of cattle guards for gates at the level crossings at Rolvenden Station and on the Cranbrook-road.

The quarterly central board meeting of the National Association of Master Plumbers was held in the council chamber of the town-hall, Scarborough, on Monday. A welcome was extended by the mayor (Mr. W. Morgan). A finance committee was elected consisting of Messrs. J. Skirrow, Leeds; Slater, Huddersfield; and P. Shipley, Bradford.

BUILDING NEW DESIGN CLUB SOME FITTINGS FOR A PUBLIC PARK

'ALL BRITISH'



PLACED FIRST

CANT 1520
TIMED COLORED, AND
PARCEL GILT

PART PLAN
(SECTION ON REAR)

LITTLE BELLRY
CONTAINING TUBULAR BELLS
(ELECTRICALLY OPERATED)
FOR SPECIAL MUSICAL EFFECTS

HALF SIDE ELEV. HALF SECTION

CROSS SECTION

THE
TEA HOUSE

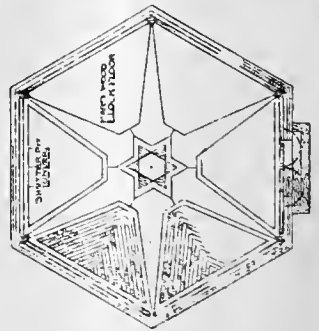
DECORATIVE BASTER CEILING
BY MR. BAYNARD
ON SOME SOUTHERN HAND

DETAIL
FOR BANDSTAND

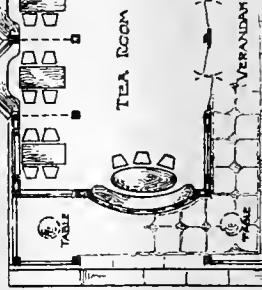
WE LOOK TO THE MODERN ARTIST TO DESIGN
OUR CHAIRS DECORATIVE DETAIL. YOURS
SHOULD BE THE SPECIAL OF THE ARCHITECT IS
TO DEAL WITH THE LARGER ISSUES
OF BUILDING LEAVING THE CRAFTSMAN
TO FILL IN THE DETAIL WHICH HE INSPIRES
AS HE MOVES AMONG THEM.
P.S. DO NOT CALL THIS VARIOUS, IS IT NOT
THE ONE HERE FOR THE REDEMPTION
OF COMMON LABOUR
TO A HIGHER PLANE.

FRONT ELEVATION

ELEVATIONS

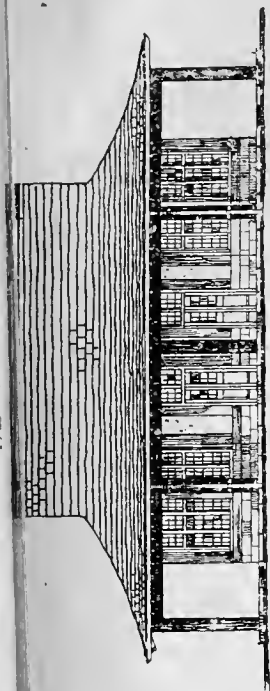


ANGLE POST

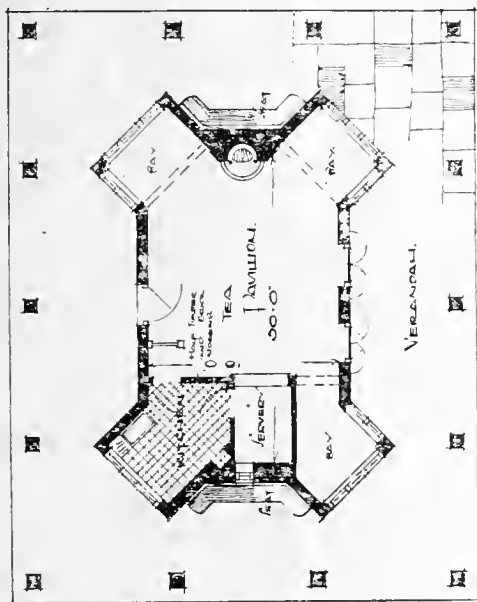


THE PLAN

AUG. 14, 1903.

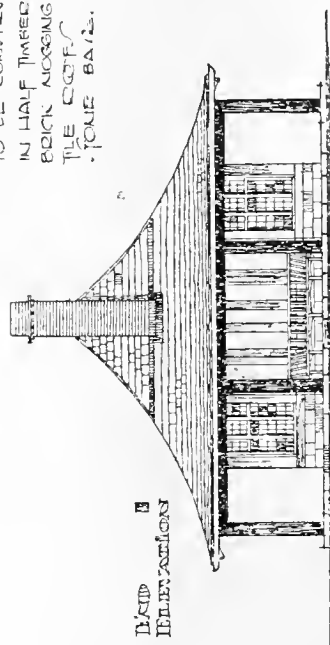


TIME TELEVISION

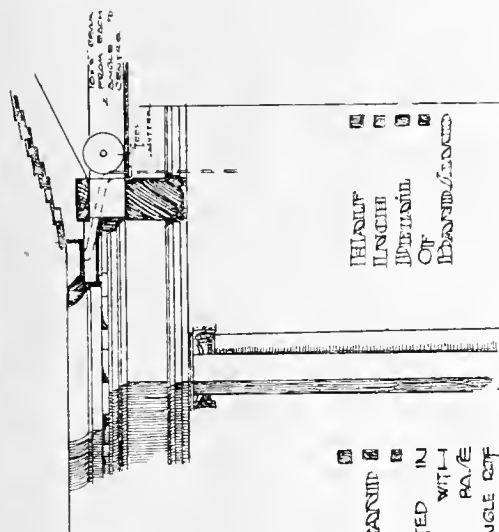
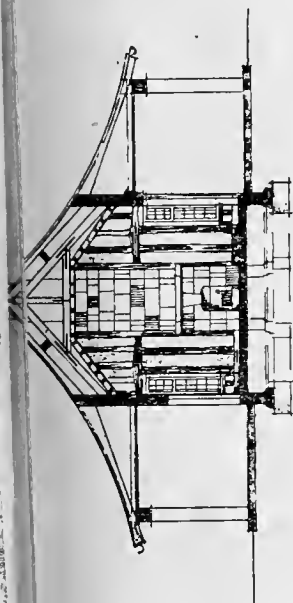


SENTS

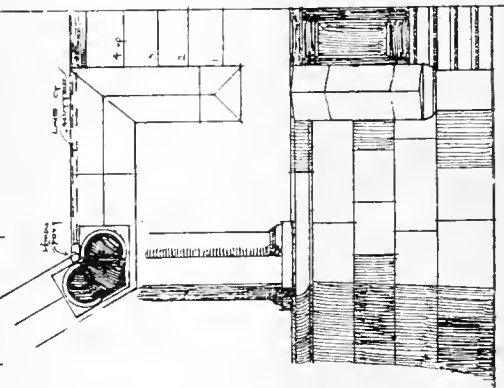
THE PATIENT
TO BE CONTACTED
IN HALF THREE WITH
BRICK MORNING 8
THE OFFICE
TONE BARS. M



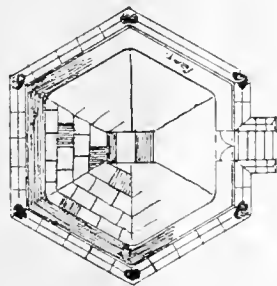
DEPT
RELATIONS



TIME
DANIEL STANLEY
TO BE
CONVICTED IN
TEAK WITH
TOMIE BASE
C OAK SINGLE RIF



BUILDING NEW/DESIGNS GIVE
 DESIGNS • FOR
 A HANDSTAND AND
 THE HANDSTAND IN
 A PUBLIC PARK



APPENDIX

Designed by SOLO

Two musical staves with handwritten notes. The top staff contains a series of notes, some with stems, and a signature 'J. S. Bach' at the end. The bottom staff contains a series of notes, some with stems, and a signature 'J. S. Bach' at the end.

WATER SUPPLY AND SANITARY MATTERS.

BARROW: THE DUDDON WATER SCHEME.—One of the difficulties with regard to the right of way for the Barrow pipe track has been overcome. When Messrs. Aird and Company commenced operations at Foxfield they began to lay a tramway, but the work came to a sudden stop when a piece of land owned by the Furness Railway Company was reached. The piece of land is that on which the original line from Whitehaven to Broughton was laid. The rails were taken up when the enterprise was transferred to the Furness Railway Company. Over this narrow strip difficulties arose with regard to the laying of Messrs. Aird's tramway. An arrangement has been come to, the contractors receiving intimation that terms have been agreed to with the Furness Railway Company, so that the work can now go on.

LEEDS WATER SUPPLY.—**LORD MASHAM AND THE LEEDS CORPORATION.**—Lieut.-Colonel W. H. Wellsted, M.L.C.E., of Hull, has issued his award in the above, amounting to £46,489. The claim was in respect of 395 acres of freehold land on the Swinton Estate, the seat of Lord Masham, taken for the construction of the Colsterdale and Leighton reservoirs and the easements required for the catchwater and two aqueducts for a length of over seven miles. The claim was put by the claimant's witnesses at £196,000, which was also for consequential damage during the construction of the works and afterwards to Swinton Castle, and the interference with the sporting rights, shooting, and fishing on the remainder of the estate and the timber. The valuations of the witnesses called by the corporation amounted to £27,000. The arbitrator for the claimant was Mr. Thos. Fenwick, C.E., Leeds, and the witnesses were Messrs. G. R. Strachan, C.E., London; John Maughan, F.S.I., Middlesbrough; C. L. N. Maister, Masham; John Farrah, F.S.I., Halifax; Fred Punchard, F.S.I., Kendal; Thos. J. Wainwright, F.S.I., Liverpool; F. G. Chinnock, F.S.I., London; and F. Fowler, F.S.I., Sheffield. The arbitrator for the Leeds Corporation was Mr. Chas. Gott, C.E., Bradford, and the witnesses were Professor Boyd Dawkins, Victoria University; Henry Roife, C.E., Westminster; C. H. Hill, C.E., Westminster; E. J. Silcock, C.E., Leeds; E. L. Clare, F.S.I., Leeds; Walter Middleton, Shipley; and J. H. Hanson, F.S.I., Huddersfield.

MARGATE.—The new water undertaking of Margate, which has been carried at a cost to the town of over £120,000, was inaugurated on Aug. 6 by the mayor. The site of the new pumping station is a mile south of Wingham, 14 miles from Margate, and the supply found is so plentiful that instead of driving adits for 3,000 yards, only 1,200 yards have been constructed, and a supply of 3,000,000 gal. daily is now available. The water is pronounced to be absolutely pure. The quantity at present required is 1,250,000 gal. daily, and the supply can be further extended at any time, for the corporation possess powers to drive adits for three miles. The scheme was prepared and carried out by Mr. Albert Latham, late borough engineer.

CHIPS.

The stone-laying of a new meeting-hall and classrooms in connection with the Providence United Methodist Free Church, Broadgate-lane, Horsforth, took place on Saturday. Mr. Mostow is the architect.

It has been found necessary to strengthen the tower of the ancient Norman church at Dover Castle.

The corner-stone of the new memorial chapel, which is to form a wing of Lancaster Parish Church, and is being erected in memory of the officers and men of the King's Own Royal Lancashire Regiment who fell in the recent South African War, was laid on Friday by the Countess of Derby. The cost of the chapel will be £3,500.

The contract for four electric lifts and two hydraulic lifts in the extensive new premises of Messrs. Robinson and Cleaver, Regent-street, W., has been awarded to Messrs. Wm. Aug's Gibson, Ltd., 25, Fleet-street, E.C.

The Duke of Argyll has formally opened the new Ganavan-road at Oban. The road commences at the west-end of the Dunollie Esplanade, of which it forms a continuation, and it winds round the base of the rock on which Dunollie Castle is built, and beyond it till it reaches Ganavan bathing beach, for which it provides a carriage access. It skirts the sea for the whole distance of two miles. The whole roadway is northward of and outside the burgh boundary, but the cost has been borne by the town.

Seaweed or seagrass paving-blocks, recently invented, are being tried in Baltimore, U.S.A. They are made by compressing the seaweed until it becomes hard and solid, when it is bound tightly with wire. The loose ends of the grass are cut off, and the block is finished by being immersed in boiling pitch or tar.

Our Office Table.

WE feel there is little need to endorse the appeal of the President of the A.A. in our correspondence columns this week for assistance towards defraying the cost of adapting and improving its new premises. Five thousand pounds ought to be raised easily by the profession in aid of so advantageous a step. Always progressive, nearly always up to date, and inheriting a record of mutual usefulness and good- comradeship unsurpassed by any similar professional association in the kingdom, its latest development ought to enlist the promptest recognition and tangible acknowledgment. There are those to-day who are advocating a "National School" for budding architects. Properly supported, the A.A. has every claim to be regarded as such, and its future, in any case, will, we are sure, do credit to its past, which has been that of a fruitful training institution for the ablest of our architects, and the best possible fostering influence of professional *esprit de corps* and good-fellowship.

THE report of the Ordnance Survey, just issued, shows that considerable progress was made with the work of the department during 1902. The most important achievement was the completion of the one-inch hill-map of the United Kingdom. This map has been in hand for many years, but had been quite unavoidably delayed, although the similar compilations for Ireland and Scotland had been completed in seven and nine years respectively. The report points out the tremendous amount of labour involved in the production of such a map as this. For instance, there are 360 sheets in England, 205 sheets in Ireland, and 131 in Scotland. A single sheet of full size takes between one and two years to engrave, and it takes from four to six months to make the hill-drawing from field sketches. This is, of course, but a portion of the whole of the Ordnance Survey during the year. The renewed military activity consequent on changes of policy at Pall Mall has created a heavy demand on the part of the War Office, and a series of maps on a two-miles-to-the-inch scale has been undertaken. It is gratifying to learn that the large scale revision is proceeding at a rate which will enable the whole country to be revised once in twenty years.

MR. G. H. FOSTER, surveyor to the rural district of St. Columb Major, has received the following letter from Marlborough House, dated July 27, 1903:—"Dear Sir,—I have very much pleasure in saying that on the occasion of their Royal Highnesses the Prince and Princess of Wales journeying through your district the road throughout was very good.—Yours faithfully, ARTHUR BIGGE, Private Secretary." We congratulate Mr. Foster and his Royal Highness the Prince of Wales. An expression of opinion like this is a sensible and laudable one, and quite as much the due of some of us who contribute to the real public and Royal comfort as similar acknowledgments to civil and military authorities who take more showy, but perhaps less useful, parts in public welcomes and rejoicings.

THE oldest church organ which has come down to our own day in anything like its original condition is said by the *Daily News* to be that which is now in Barnsbury-street Congregational Chapel, Islington. It was built in 1660 by Bernard Schmidt, for Westminster Abbey, and its original cost was £120. It was placed above the stalls on the north side of the choir, and was played upon by Blow, Purcell, and Croft. In 1730 it was removed to make room for Shreider and Jordan's organ, and sold to the parish of St. Margaret's, Westminster. After being stored for many years in the tower there, it was re-erected in Barnsbury Chapel by Holditch, who added two octaves of pedal pipes outside the ends of the old case, and made some other slight alterations; but except for the additions mentioned, Schmidt's work remains practically intact.

AT Marlborough-street last Friday, in fining a scavenger (who had been previously convicted) 20s. for "rummaging" in dust-bins in streets in the West End, Mr. Denham remarked that it had been a matter of wonder to him for years that in the heart of the wealthiest city in the world there was no better method of removing refuse than the one now used, which would have been almost disgraceful in the Middle Ages. These large metal boxes of filth were stood in the footway to the danger to health and to the inconvenience of the public, and when they were

routed over by such persons as the defendant the trouble was increased tenfold.

THE Hon. W. Fred D. Smith, M.P., writes to the daily Press explaining the position in which the suggestion to move King's College Hospital to another site now stands. During the present summer a special committee of gentlemen unconnected with either the college or hospital was appointed to consider the question of a change of site; that committee reported strongly in favour of removal; and their report has been already adopted by the council of King's College and the committee of the hospital, two of the three bodies whose consent is necessary before any active steps can be taken. There remains the body of governors, whose decision will be taken early in the autumn. Meanwhile, a joint committee, of which Mr. Smith, M.P., is the chairman, has been appointed by the council of the college and the committee of the hospital; and if the decision of the governors is favourable to removal, immediate steps will be taken to collect the very large sum of money, probably amounting to £300,000, which will be required to install the hospital on a new site.

MR. W. RUSKIN BUTTERFIELD, of St. Leonards-on-Sea, states that during the last few years he has found large numbers of specimens of worked flints on the high ground in the neighbourhood of Fairlight Church, near Hastings. For the most part, the implements do not exhibit very elaborate workmanship, and Mr. Butterfield has found only two polished examples, both of which closely resemble implements from the South Downs near East Dean. Other specimens are identical in shape and working with the diminutive forms found by Mr. Lewis Abbott in the Hastings "Kitchen Middens," and figured in the *Journal of the Anthropological Institute*, Vol. XXV. pl. x., xii., xiii. The single fragment of pottery found appears to have formed part of the rim of a round vessel. It is ornamented with a number of regular oblique parallel lines.

THOMAS SMITH, aged 42 years, a bachelor stone-cutter of Reading, Pa., U.S.A., recently died at that city of inflammatory rheumatism. For years he was a recluse. He left a will, declaring that his £1,600 estate should be turned into money and be expended for a monument over his grave, as follows:—"I direct that a model of a statue of a man 5ft. high shall be erected and put on the top of my monument, and said statue shall stand upon a rough rock, and the reason why I want this said monument in the way or style in which I direct it to be made, is because I worked at the same trade near all my lifetime." Why "Tommy" should stipulate that the man mounted upon the rock should only be 5ft. high is not apparent!

A new edition of their catalogue of fire-escape iron staircases, doors, verandahs, balconies, and roofs has just been issued by the St. Pancras Ironwork Company, Ltd., 171, St. Pancras-road, in which several new features appear of interest to architects and others. The new patent non-slipping tread for staircases is a very important feature. It consists of a slab 1½ in. thick, made of steel imbedded in a peculiar manner in a special kind of concrete, on the wearing surface of which a series of lead rings is inserted. The slabs are made 10 in. from back to front and 12 in. wide, and half-slabs 6 in. wide. They drop into a rebate at the top and bottom of adjoining risers, the front edge being protected by an iron nosing. Their strength is very great: one slab a month old stood with 25 cwt. on it. These slabs can be used on both wood and stone steps, and enable a worn staircase to be turned into a new and safe one. Several illustrations of staircases, one on rolled iron girders, doing away with columns, and others made for H.M. War Office in barracks and prisons, double staircases with wrought-iron ornamental balusters, and external fire-escape staircases for fixing outside public buildings are shown. Other examples of ironwork to factories, &c., covered bridges, porches and verandahs, iron roofs, domical structures, and lift inclosures afford many suggestions of value.

The Bishop's Stortford Urban District Council have decided to acquire a site, at a cost of £4,000, for the erection of new public offices and a depot.

In the course of the storm on Tuesday, the hexagonal spire of Eton Church, near Peterborough, was seriously damaged by lightning. The weathercock, with several feet of masonry, became dislodged, and fell on the roof. The steeple was split for a considerable way down.

Trade News.

WAGES MOVEMENTS.

AMALGAMATED CARPENTERS AND JOINERS.—In the August report of the Amalgamated Society of Carpenters and Joiners, Mr. Chandler, the secretary, says:—"Judging by the numbers returned as unemployed the state of trade is not in that flourishing condition which we usually hope for and expect to find at this period of the year, and the fact that in none of the preceding months have our reports shown less than 1,500 on the books, and have even reached a total of 3,452, we may reasonably anticipate that our liabilities under the heading of unemployed benefit will again be exceedingly heavy. This experience appears general in its character, affecting both the house and shipbuilding industries, as apart from about 250 who are outside the United Kingdom, the remainder is made up by members in this country." The total membership of the society is now 72,185, and at the end of July 2,015 were on unemployed benefit, and 1,313 on sick. The available cash balance—the value of property appears only in the annual report—was at the end of June £152,255 11s. 8½d., as compared with £151,027 10s. 1½d. in March, and £169,527 7s. 5½d. in June, 1902.

BRADFORD MASONS' DISPUTE.—Sir William Markby, who has been appointed by the Board of Trade, at the request of the Mayor of Bradford, to act as arbitrator in the masons' dispute, heard evidence, on Monday, on behalf of the masons and the men. The matter in dispute has reference to the agreement which was arrived at at the conclusion of the last strike, to the effect that society men should do no more than use "moral persuasion" to induce the non-unionists to join their ranks. The trade unionists now say that this agreement operates to their disadvantage, and at the beginning of the year gave a six months' notice in reference to this clause. The notice expired at the end of last month, but no action was taken, as it had been mutually decided to submit the matter in dispute to arbitration. It is expected that the arbitrator will give his award in a few days.

SUNDERLAND.—The Sunderland house joiners have refused to accept the terms of the mayor. The suggestions were that the men should withdraw their application for an advance of ½d. per hour, that the masters should withdraw their notice of a reduction by the same amount, that the men resume work at the old rate (9½d. per hour), and that the question be considered three months hence.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rollad-Iron Joists, Belgian.....	£5 10 0	to £5 15 0
Rollad-Iron Joists, English.....	6 10 0	" 6 12 6
Wrought-Iron Girder Plates.....	7 0 0	" 7 5 0
Bar Iron, good Staffs.....	8 5 0	" 8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0	" 20 0 0
Do., Welsh.....	5 15 0	" 5 17 6
Builder Plates, Iron—		
South Staffs.....	8 15 0	" 8 15 0
Best Snedshill.....	9 10 0	" 9 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.		
Builders' Hoop Iron, galvanised, £12 to £13 per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£11 15 0	to £12 0 0
Best ditto.....	12 5 0	" 12 10 0
Cast-Iron Columns.....	£8 10 0	to £8 10 0
Cast-Iron Stanchions.....	6 10 0	" 8 10 0
Rollad-Iron Fencing Wire.....	8 0 0	" 8 5 0
Rollad-Iron Fencing Wire.....	6 5 0	" 6 10 0
Do., Steel Galvanised.....	7 15 0	" 8 0 0
Cast-Iron Sash Weights.....	4 12 6	" 4 12 6
Cut Clasp Nails, Sin. to 6in.....	9 5 0	" 9 5 0
Cut Floor Brads.....	9 0 0	" 9 0 0
Wire Nails (Points de Paris)—		
6 to 7 8 9 10 11 12 13 14 15 B.W.G.		
8- 8 6 9- 9 6 9 9 10 8 11 3 12- 13- per cwt.		
Cast-Iron Socket Pipes—		
Sin. diameter.....	£5 15 0	to £8 0 0
6in. to 6in.....	5 12 8	" 5 17 6
7in. to 24in. (all sizes).....	5 7 6	" 5 10 0
(Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 8d. per ton extra.)		
Pig Iron—		
Cold Blast, Lilleshall.....	105s. 0d.	to 112s. 6d.
Hot Blast, ditto.....	65s. 0d.	to 70s. 0d.
Wrought-Iron Tubes and Fittings—Discount off Standard		
Lists f.o.b. (plus 5 per cent.) :—		
Gas-Tubes.....	67½ p.o.	
Water-Tubes.....	62½ "	
Steam-Tubes.....	57½ "	
Galvanised Gas-Tubes.....	55 "	
Galvanised Water-Tubes.....	50 "	
Galvanised Steam-Tubes.....	45 "	
10cwt. casks. 5cwt. casks.		
Per ton.	Per ton.	
Line, English (London mill).....	£23 0 0	to £24 10 0
Do., Vieille Montagne.....	26 5 0	" 28 15 0
Sheet Lead, 5lb. and upwards.....	13 12 6	" 14 0 0

Lead Water Pipe (F.O.R. Lond.)	£14 2 6	to £14 10 0
Lead Barrel Pipe.....	15 2 6	" 15 2 6
Lead Pipe, Tinned inside.....	16 2 6	" 16 2 6
Do., and outside.....	17 12 6	" 17 12 6
Composition Gas-Pipe.....	16 2 6	" 16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6	" 16 2 6
Pig Lead, in 1cwt. pigs.....	10 16 3	" 10 17 6
Lead Shot, in 25lb. bags.....	15 0 0	" 15 0 0
Copper Sheets, sheathing and rods.....	71 0 0	" 71 0 0
Copper, British Cake and Ingots.....	59 10 0	" 60 0 0
Tin, Straits.....	130 0 0	" 130 10 0
Do., English Ingots.....	129 0 0	" 129 10 0
Spelter, Silesian.....	20 2 6	" 20 10 0

TIMBER.

Teak, Burmah.....per load	£10 0 0	to £18 10 0
" Bangkok.....	10 0 0	" 16 10 0
Quebec Pine, yellow.....	3 17 6	" 6 5 0
" Oak.....	4 15 0	" 7 10 0
" Birch.....	5 10 0	" 10 5 0
" Elm.....	4 10 0	" 9 0 0
" Ash.....	4 15 0	" 8 5 0
Dantaic and Memel Oak.....	2 12 6	" 6 5 0
Fir.....	3 2 6	" 5 10 0
Wainscot, Riga p. log.....	2 7 6	" 5 5 0
Lath, Dantaic, p.f.....	4 0 0	" 6 0 0
St. Petersburg.....	4 0 0	" 6 0 0
Greenheart.....	7 15 0	" 8 0 0
Box.....	7 0 0	" 15 0 0
Sequoia, U.S.A.....per cube foot	0 3 6	" 0 3 9
Mahogany, Cuba, per super foot		
lin. thick.....	0 0 6	" 0 0 8
" Honduras.....	0 0 6	" 0 0 7 ½
" Mexican.....	0 0 4	" 0 0 5
" African.....	0 0 3 ½	" 0 0 5 ½
Cedar, Cuba.....	0 0 3	" 0 0 3 ½
" Honduras.....	0 0 3 ½	" 0 0 3 ½
Satinwood.....	0 0 10	" 0 1 9
Walnut, Italian.....	0 0 3	" 0 0 7 ½
" American (logs).....	0 3 1	" 0 3 1

Deals, per St. Petersburg Standard, 120—12ft. by 1½in.

by 1½in. :—		
Quebec, Pine, 1st.....	£22 0 0	to £29 5 0
" 2nd.....	18 5 0	" 23 10 0
" 3rd.....	11 15 0	" 14 0 0
Canada Spruce, 1st.....	11 10 0	" 15 1 0
" 2nd and 3rd.....	8 10 0	" 10 0 0
New Brunswick.....	8 10 0	" 10 0 0
Riga.....	7 10 0	" 8 5 0
St. Petersburg.....	8 10 0	" 16 5 0
Swedish.....	11 5 0	" 19 5 0
Finland.....	8 15 0	" 10 0 0
White Sea.....	11 15 0	" 19 5 0
Battens, all sorts.....	6 10 0	" 14 0 0

Flooring Boards, per square of lin. :—

1st prepared.....	£0 13 6	" £0 19 0
2nd ditto.....	0 12 0	" 0 16 0
Other qualities.....	0 6 3	" 0 14 0
Staves, per standard M :—		
U.S. pipe.....	£37 10 0	" £45 0 0
Memel, cr. pipe.....	220 0 0	" 230 0 0
Memel, brack.....	190 0 0	" 200 0 0

STONE.

Darley Dale, in blocks.....per foot cube	£0 2 3
Red Mansfield ditto.....	" 0 2 4
Hard York ditto.....	" 0 2 10
Ditto ditto 6in. sawn both sides, landings,	
random sizes.....per foot sup.	0 2 8
Ditto ditto 3in. slabs sawn two sides,	
random sizes.....	£0 1 3

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations.....per foot cube £0 1 0

Delivered on road waggons, Puddington.....per foot cube £0 1 6 ½

Depot.....per foot cube £0 1 8 ½

Ditto ditto Nine Elms Depot.....per foot cube £0 1 8 ½

Portland Stone, in random blocks of 20ft. average :—

Brown.....White

Whit Bed. Base Bed.

Delivered to railway depot at the

quarry.....per foot cube £0 1 5 ½ to £0 1 7 ½

Delivered on road waggons

at Puddington Depot.....per foot cube £0 2 1 to £0 2 2 ½

Ditto Nine Elms Depot.....per foot cube £0 2 1 to £0 2 2 ½

Ditto Pimlico Wharf.....per foot cube £0 2 1 to £0 2 2 ½

FEVERE AND CO.

Blocks Palotte Banc Franc.....	1 5	per c. ft. ex.
steamers London.		
Ditto ditto Banc Royal.....	1 3	do. do.
Ditto Evuille.....	1 9	do. do.
Ditto Comblanchet.....	3 0	do. do.
Ditto Massangis (Roche).....	2 6	do. do.

OILS.

Linsed.....per tun	£19 10 0	to £20 0 0
Rapeseed, English pale.....	23 15 0	" 23 15 0
Do., brown.....	22 5 0	" 22 5 0
Cottonseed, refined.....	23 0 0	" 24 5 0
Olive, Spanish.....	32 0 0	" 32 0 0
Seal, pale.....	26 0 0	" 29 0 0
Cocoonut, Cochins.....	32 0 0	" 32 0 0
Do., Ceylon.....	25 0 0	" 25 0 0
Palm, Lagos.....	26 10 0	" 27 0 0
Oleine.....	17 5 0	" 19 5 0
Lubricating U.S.....per gal.	0 7 0	" 0 8 0
Petroleum, refined.....	0 0 5 ½	" 0 0 6
Tar, Stockholm.....per barrel	1 8 0	" 1 8 0
Do., Archangel.....	9 19 8	" 1 0 0
Turpentine, American.....per tun	37 0 0	" 87 5 0

With a view of endeavouring to prevent that portion of Great Clowes-street, Salford, known locally as the Cliff, from slipping into the Irwell, the corporation have decided to expend £5,551 upon the operation.

The work of restoring the fine old parish church of Hawarden has commenced. The roof and steeple are undergoing renewal or repairs, and some of the vaults in the body of the church have been filled with concrete. The cost will be £550.

PILKINGTON & CO.

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MONUMENT CHAMBERS,

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WM. OLIVER & SONS, Ltd.,

MAHOGANY, WAINSCOT, WALNUT,

TEAK, VENEER, and FANCYWOOD

MERCHANTS,

120, BUNHILL ROW, LONDON, E.C.

The most extensive Stock of every kind of Wood in Planks and Boards, dry and fit for immediate use.

TENDERS.

*. Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BATTERSEA.—For reconstructing boiler flue at Gideon-road School, for the London School Board :—

Hammond, W.....	£239 0 0
Maxwell Bros., Ltd.....	238 0 0
Lathey Bros.....	222 0 0
Triggs, E.....	190 0 0
Rockhill Bros.....	178 0 0
Ronald, R. S.....	145 0 0
Williams, R. E., and Sons.....	143 0 0
Dowsett and Jenkins.....	136 0 0
Garrett, J., and Son.....	136 0 0
Tucker, E. B., Lavender Hill.....	117 15 0

* Accepted.

BETHNAL GREEN.—For redividing classrooms, &c., for the London School Board in Turin-street Boys' and Girls' School :—

Johnson and Co.....	Schedule + 20 p.c.
Turnbull and Son.....	£1,615 0 0
Wood, F. and F. J.....	1,598 0 0
Lawrance, E., and Sons.....	1,555 0 0
Williams, G. S. S., and Son.....	1,479 0 0
Stewart, J.....	1,385 0 0
Bull, F.....	1,333 0 0
Grover, J., and Son.....	1,292 0 0
McCormick and Sons.....	1,246 0 0
Belcher and Co., Ltd.....	1,100 0 0
Marchant and Hirst, Highgate-road.....	990 0 0

* Accepted.

BRIXHAM.—For street improvements in St. Mary's Ward, for the urban district council :—

Hayman, P. (accepted).....£971 12 2

CHELSEA.—For carrying out various improvements at Victoria School, for the London School Board :—

General Builders, Ltd.....	£539 0 0
Chuncheon, F. T., and Co.....	519 0 0
Hammond, W.....	503 0 0
Lathey Bros.....	499 0 0
Willmott, J., and Sons.....	425 0 0
Hide, W. R. and A.....	365 0 0
Polden, S. (accepted).....	351 0 0

CHELSEA.—For reconstructing boiler flues at Ashburnham School, for the London School Board :—

Sims, J. R.....	£221 0 0
Maxwell Bros., Ltd.....	189 0 0
General Builders, Ltd.....	187 0 0
Rice and Son.....	169 0 0
Rockhill Bros.....	158 0 0
Ronald, R. S.....	154 0 0
Williams, R. E., & Sons.....	148 0 0
Tucker, E. B., Lavender Hill.....	122 0 0

* Accepted.

CLAPHAM PARK, S.W.—For new graded school to provide accommodation for 996 children on the Bunneville-road site, Clapham Park, for the London School Board :—

Armichael, J.....	£21,517 0 0
Holliday and Greenwood, Ltd.....	21,460 0 0
Lathey Bros.....	21,279 0 0
Marsland, J., and Sons.....	21,233 0 0
Stimpson and Co.....	20,641 0 0
Higgs, F. and H. F.....	20,637 0 0
Bowyer, J. and C.....	20,593 0 0
Smith, J., and Sons, Ltd.....	20,552 0 0
Downs, W.....	20,535 0 0
Mitchell, W. J., and Sons.....	20,483 0 0
Wallis, G. E., and Sons.....	20,478 0 0
Lawrance, E., and Sons.....	20,338 0 0
Treasure and Son.....	20,325 0 0
Garrett and Son, J.....	20,310 0 0
Appleby, J., and Sons.....	20,278 0 0
Holloway Bros., Ltd.....	20,062 0 0
Martin, Wells, and Co., Ltd.....	19,665 0 0
Patrick, J. and M., Wandsworth.....	19,411 0 0

* Accepted.

DALTON-IN-FURNESS.—For painting the council offices, for the urban district council :—

Fisher, J., Market-street, Dalton.....£74 0 0

(Accepted.)

(Continued on page XI.)

LIST OF COMPETITIONS OPEN.

Blackpool—New Offices, Sefton-street	C. Arthur, 34, Victoria-street, Blackpool	Aug. 31
Howden, Yorks.—Sewerage Improvement	Henry Green, Clerk, R.D.C. Offices, Howden, Yorks	Sept. 12
Stonehaven—Additions to Town Hall	George Murdoch, Burgh Surveyor, Stonehaven, N.B.	" 12
Heywood—Library (£1,500)	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood	" 14
Ayr—Hospital	J. E. Shaw, Clerk to Lunacy Board, County Buildings, Ayr	" 22
Leyland, Lancs.—Laying-out Land (11,302 square yards)	M. H. Wilkinson, Surveyor, 21, Towngate, Leyland	" 26
Brighton—Hospital for Women (Assessor)	Leonard Holmes, Hon. Sec., 76, West-street, Brighton	" 29
Dublin—Workmen's Cottages	Francis B. Ormsby, Secretary, Kingsbridge Terminals, Dublin	" 30
Bromley, E.—Public Library	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.	Oct. 2
Rawtenstall—Free Library and Town Hall (Assessor)	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	" 12
Vienna—Machinery to Lift Boats	The Austro-Hungarian Consulate-General, 23, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Acton, W.—School (250 places) (Assessor)	B. S. Gott, Clerk to Governors, Guildhall, Westminster	—
Gillingham—School (900 places)	E. T. Atchison, Sec., 8, Waterloo-place, New Brompton, Kent	—
Fraserburgh—Higher-Grade School (550 pupils)	Alex. Henderson, Clerk to School Board, Fraserburgh	—

LIST OF TENDERS OPEN.

BUILDINGS.

Epsom—Stables, &c., at Sewage Farm	Urban District Council	Edward R. Capon, Surveyor, Bromley Hurst, Epsom	Aug. 15
Quadrang—Restoration of Nave Roof, &c.	Corporation	C. Hodgson Fowler, F.S.A., The College, Durham	" 15
Northampton—Carsheds, Work-shops, &c.	Trustees	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton	" 15
Distington—Alterations to House	Urban District Council	S. D. Stanley-Dodgson, Somerset House, Whitehaven	" 15
Kidwelly, Wales—Alterations to Calvinistic Methodist Chapel	Urban District Council	Anthony and Sons, Anchor House, Kidwelly	" 15
Pontllytyn—Vestry at Zoar Baptist Church	Urban District Council	The Rev. R. Jones, Pontllytyn, Wales	" 15
Epsom—Depot, Church-street	Urban District Council	Edward R. Capon, Surveyor, Bromley Hurst, Epsom	" 15
Inverurie—House at Newbigging	Corporation	Davidson and Garden, 12, Dee-street, Aberdeen	" 15
Northampton—Power Station Buildings	Corporation	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton	" 15
Seaton Delaval—St. Stephen's Mission Church	Corporation	C. S. Errington, A.R.I.B.A., Grainger-st. West, Newcastle-on-Tyne	" 15
Pwllheli—Nine Houses, Ala-road	School Board	Henry Thomas, Architect, 7, Castle-ditch, Carnarvon	" 15
Cummertrees—Additions, &c.	School Board	A. Sinclair Nicol, Clerk, Maunse of Cummertrees, Ennau	" 15
Aberdeen—Cottage at Horsewells	Urban District Council	Alex. Stronach, jun., & Sons, Advocates, 20, Belmont-st., Aberdeen	" 17
Stourbridge—Free Library and Technical Institute	Urban District Council	Frederick Woodward, Architect, Town Hall, Stourbridge	" 17
Stratford—Steading at Farm of Delavine	Corporation	Charles Christie, Factor, Estate Office, Stratford	" 17
Preston—Tramway Power Station	Corporation	W. H. Tittensor, Electrical Engineer, 25, Burrow-road, Preston	" 17
Trevethin—Church Sunday School	Caledonian Railway Co.	D. J. Lougher, Bank Chambers, Pontypool	" 17
Plean Junction—Passenger Station	Caledonian Railway Co.	The Company's Divisional Engineer, 16, Killermont-st., Glasgow	" 17
Stratford—Alterations to Stable, &c., Wester Tournabaish	Gelligaer School Board	Charles Christie, Factor, Estate Office, Stratford	" 17
Brithdir—School, &c.	Corporation	James and Morgan, M.M.S.A., Charles-st. Chambers, Cardiff	" 17
Glasgow—Crosshill and Govanhill District Library	Corporation	G. B. Walker, Measurer, 65, Bath-street, Glasgow	" 17
Stainburn—Five Cottages	Tramways Committee	Joseph Iredale, Stainburn	" 17
Burnley—Offices, Queensgate Car Depot	Urban District Council	G. H. Pickles, A.M.I.C.E., Borough Surveyor, Town Hall, Burnley	" 17
Stourbridge—Free Library and Technical Institute	Urban District Council	Frederick Woodward, Architect, Town Hall, Stourbridge	" 17
Newchurch—Rebuilding Church	Urban District Council	Travers and Ramsden, Architects, 44, Church-st., Leigh, Lancashire	" 17
Coventry—Six Houses, King Edward's-road	Coventry Perseverance Co-op. Soc.	Harrison and Hattrell, Architects, 23, Hertford-street, Coventry	" 18
Quilford—Additions to Whitmoor Common Hospital	Joint Hospital Board	A. J. Sturges, Architect, High-street, Guilford	" 18
North Shields—Accumulator House at Electrical Station	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	" 18
Hasland—Mixed School	School Board	Rollinson and Sons, Architects, 13, Corporation-street, Chesterfield	" 18
Cardiff—Electrical Department at Infirmary	Joint Hospital Board	Edwin Seaward, F.R.I.B.A., Architect, Cardiff	" 18
Quilford—Porter's Lodge, &c., at Woodbridge Hospital	Joint Hospital Board	E. L. Lunn, Architect, 36, High-street, Guilford	" 18
East Acton—Isolation Hospital Buildings at The Friars	Coventry Perseverance Co-op. Soc.	D. J. Ebbetts, A.R.I.B.A., 242, High-street, Acton, W.	" 18
Coventry—Shops and Stores, Harnall-lane, East	H.M. Commissioners of Works	Harrison and Hattrell, Architects, 23, Hertford-street, Coventry	" 18
Ilford—Post Office	Hasland School Board	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 18
Grassmoor—Mixed School	North's Navigation Collieries Co.	Rollinson and Sons, Architects, 13, Corporation-street, Chesterfield	" 18
Easter Colfield—Cottages	Woolmer White	A. and W. Reid and Wittet, Architects, Elgin	" 19
Caerau—Manager's House	Rural District Council	E. W. Burnett and Son, Architects, Tondur	" 19
Woolmer Forest—Ten Six-roomed Houses	School Board	Rake and Cogswell, Architects, Prudential Buildings, Portsmouth	" 19
Kinsale—Six Cottages	Whitaker and Co.	John Murphy, Clerk, Board-room, Workhouse, Kinsale	" 19
Cardiff—Extension of Trinity Congregational School	Rural District Council	The Rev. D. Tyssil Evans, 5, Eton-place, Cardiff	" 19
Hemsworth—Caretaker's House, &c.	Urban District Council	W. E. Richardson, Architect, Rothwell, Leeds	" 19
Otley—Stabling, &c.	Urban District Council	H. Chippendale, Architect, Guiseley, near Leeds	" 19
Huddersfield—Five Lock-Up Shops at Crosland Moor	Urban District Council	J. Berry, Architect, 3, Market-place, Huddersfield	" 19
Knaresborough—Engine-House	Urban District Council	William Lupton, 44, Station-parade, Harrogate	" 19
Cleethorpes—Shelter, &c.	Urban District Council	E. Rushton, Engineer, Poplar-road, Cleethorpes	" 19
Llandilofawr—Organ Chamber at Parish Church	Urban District Council	David Jenkins, F.R.I.B.A., Architect, Llandilo	" 19
Shelley—Enlargement of Manager's House	Urban District Council	E. W. Lockwood, Architect, 37, Byron-arcade, Huddersfield	" 20
Upton-on-Severn—Isolation Hospital	Urban District Council	Lewis, Sheppard, and Son, Archts., 50, Foregate-street, Worcester	" 20
Warrington—Glass Roof, Bank Park	Urban District Council	Thos. Longdon, Borough Engineer, Town Hall, Warrington	" 20
Marsden—Choir Stalls, &c.	Urban District Council	Kirk and Sons, John William-street, Huddersfield	" 20
Swansea—Alterations at Harbour Offices	Urban District Council	John Thomas, A.M.I.C.E., 32, Fisher-street, Swansea	" 20
Risca—Fifty Workmen's Dwellings	Urban District Council	J. Williams, Engineer, Public Hall, Risca	" 20
Wombwell—Six Houses, Hough-lane	Urban District Council	A. B. Linford, Architect, Carlton Villa, Wombwell	" 20
Epsom—Long Grove Asylum Foundations	Urban District Council	The Clerk, Asylums Committee, 6, Waterloo-place, S.W.	" 20
Minsbridge—Alterations to Three Shops, Market-street	Urban District Council	John E. Lunn, Architect, Millsbridge	" 21
Rhymney—Rebuilding St. Mark's Church	Urban District Council	J. Llewellyn Smith and Davies, Architects, Aberdare	" 21
Tooley-street, S.E.—Out-Relief Stores, St. Olave's Union	Urban District Council	Newman and Newman, Architects, 31, Tooley-street, S.E.	" 21
Barrow-in-Furness—Alterations to Old Municipal Buildings	Urban District Council	The Borough Engineer, Barrow-in-Furness	" 21
Llanelli—Additions to Lloyd-street Chapel	Urban District Council	D. L. Jones, Architect, 12, West-end, Llanelli	" 21
Paddington—Room at Public Baths, Queen's-road	Urban District Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	" 21
Leicester—Shop Front	Urban District Council	T. Caun Hughes, Town Clerk, Town Hall, Lancaster	" 21
Colwyn Bay—Isolation Hospital	Urban District Council	Wm. Jones, A.M.I.C.E., Station-road, Colwyn Bay	" 21
Leeds—Rebuilding Office Premises, Albion-street	Urban District Council	Thos. Winn and Sons, Architects, 92, Albion-street, Leeds	" 21
Newcastle-on-Tyne—School, Forsyth-road	Urban District Council	C. S. Errington, A.R.I.B.A., Grainger-st. West, Newcastle-on-Tyne	" 21
Grimby—Sub-Balancing Station	Urban District Council	W. A. Vignoles, M.I.E.E., Borough Electrical Engineer, Grimby	" 21
Newark—Workhouse Infirmary	Urban District Council	A. Marshall, A.R.I.B.A., King-street, Nottingham	" 21
Selly Oak—Boiler-House at Workhouse	Urban District Council	C. Whitwell and Son, Architects, Temple-row, Birmingham	" 21
Builth Wells—Rebuilding Portions of St. Mary's Church	Urban District Council	Telfer Smith, M.S.A., Architect, Builth Wells	" 21
Montrose—Carnegie public library	Urban District Council	J. Lindsay Grant, Architect, Manchester	" 21
Elgin—Rebuilding Business Premises	Urban District Council	R. B. Pratt, Architect, Bank Buildings, Elgin	" 21
Birmingham—Enlargement of Head Post Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Crookston—Poorhouse	Urban District Council	MacWhannell and Rogerson, 58, West Regent-street, Glasgow	" 21
Nuneaton—Infirmary and Laundry	Urban District Council	H. Quick, Architect, 64, Hertford-street, Coventry	" 21
Barry Dock, Cardiff—Branch Post Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Troedyrhiw—Boys' School (400 places)	Urban District Council	J. Llewellyn Smith, Architect, Aberdare	" 21
Portadown—Alterations to Armagh-road Presbyterian Church	Urban District Council	T. Houston, Architect, Wellington-place, Belfast	" 21
Newark—Infirmary Buildings, Bowbridge-road	Urban District Council	Arthur Marshall, F.R.I.B.A., Architect, King-street, Nottingham	" 21
Leicester—Enlargement of Head Post Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Halifax—Administrative Block at Workhouse, Gibbet-street	Urban District Council	W. Clement Williams, F.R.I.B.A., Archt., 29, Southgate, Halifax	" 21
Goldthorpe—School	Urban District Council	Higginbottom and Wagstaff, Architects, Saltergate, Chesterfield	" 21
Halifax—Three-Story Warehouse and Bakery, King-street	Urban District Council	Jackson and Fox, Architects, Rawson-street, Halifax	" 21
Drogheda—Cycle Works, &c.	Urban District Council	F. H. Tallan, Architect, 356, Kildare-street, Dublin	" 21
Bristol—Tobacco Warehouses	Urban District Council	W. W. Squire, Engineer, Cumberland-road, Bristol	" 21
New Malden—Public Offices, Fire Station, &c.	Urban District Council	Wm. Hope, Architect, Seymour-road, Hampton Wick	" 21
Burton-in-Lensdale— Wesleyan Sunday-school	Urban District Council	R. Richardson, Halfway House, Cantsfield, Kirby Lonsdale	" 21
Turnberry—Hotel	Urban District Council	James Miller, F.R.I.B.A., 15, Blythwood-square, Glasgow	" 21
Batley—Town Hall Extensions	Urban District Council	W. Hanstock and Son, Architects, Branch-road, Batley	" 21
Cannoek—Laundry Alterations, &c.	Urban District Council	Ashton Veall, 84, Darlington-street, Wolverhampton	" 21
Wem—Market House	Urban District Council	James Brown, Architect, 12, Castle-street, Shrewsbury	" 21
Pontypridd—Public Offices, Morgan-street	Urban District Council	Henry T. Hare, F.R.I.B.A., Architect, 13, Hart-street, W.C.	" 21
Pennyraig—Two New Departments	Urban District Council	J. Rees, Architect, Hillside Cottage, Pentre	" 21
Birmingham—Engine and Boiler-Houses, &c.	Urban District Council	Mansergh and Sons, Engineers, 5, Victoria-street, Westminster	" 21
Barry Docks—Mercantile Marine Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Hemsworth—Fifteen Houses	Urban District Council	Jas. Simmons, Hague-lane, Hemsworth	" 21
Leeds—Five Houses and Shops, Harehills-lane	Urban District Council	W. Mason Coggill, Architect, Stourton, Hunslet	" 21
Westgate—Rebuilding Front of Elephant and Castle Hotel	Urban District Council	John Jackson, Architect, Barry-street, Bradford	" 21
Nottingham—Board School, Sneinton Boulevard	Urban District Council	F. B. Lewis, City Architect, Guildhall, Nottingham	" 21

PORTLAND CEMENT

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Many Cements of British and Foreign manufacture contain Rubbish of all Descriptions, such as GYPSUM, KENTISH-RAG STONE, BRICK-RUBBISH, SAND, FURNACE-CLINKER, &c., to an extent in some cases of 25 per cent.

PURE PORTLAND CEMENT—the only Cement which will stand the test of time—is made solely from CHALK and CLAY.

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AFTER LEAVING THE KILNS.*

THE **RED-CROSS BRAND** IS



Pure, Well Burnt, Finely Ground, of High Specific Gravity and Tensile-Strain, and is specially adapted for use in Sea-Water.

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(WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.)

TELEGRAMS: "ENRICHING, LONDON."

TELEPHONE, No. 1846 AVENUE.

BUILDINGS—continued.

Bramhope—House	North-West Ward Liberal Assoc.	Child and Co., Architects, 149, Park-lane, Leeds	Aug. 15
Woodhouse—Club Premises	Thurles—Residence	T. A. Buttery and S. B. Birds, Architect, 1, Basing-hall-st., Leeds ..	—
Whitby—Additions to Bagdale Old Brewery	R. D. Spaven and Co.	William Maher, Main-street, Thurles	—
Glyncorrwg—Four Houses	Edward Hughes	Harold G. Walker, Architect, Skinner-street, Whitby	—
Winfrith—Alterations to Winfrith House	Greulands, Ltd.	Daniel Lewis, Glyncorrwg	—
Bishop Auckland—Minister's House, Cockton-hill	Mrs. F. J. Flower	F. R. Bates, Architect, Newport, Mon.	—
Hereford—Furniture Repository, Commercial-road	Soldiers' and Sailors' Fam. Assoc.	T. E. Davidson, Architect, Newcastle-on-Tyne	—
Brampton, Cumberland—Teachers' Residence, Lees Hill School	Equitable Provident Society	W. W. Robinson, Architect, King-street, Hereford	—
Rowhatch Chick, St. C. yth, Essex—Residence	Education Committee	The Rev. T. W. Willis, Luncheon Vicarage, Brampton	—
Salford—School, Liverpool-street	John M. Dossor, A.R.I.B.A., 2, Minor-street, Hull	G. Gardiner, Architect, Marine Parade, Clacton-on-Sea	—
Wimbleton—Two Blocks of Flats	—	L. C. Evans, Town Clerk, Town Hall, Salford	—
Colchester—Wesleyan Church and School	—	C. E. Lancaster Parkinson, A.R.I.B.A., 41 Bedford-row, W.C.	—
Macclesfield—Provision Shop	—	Gooder and Cressall, Architects, Victoria Chambers, Colchester	—
Bingley—Detached Residence, Myrtle Grove Estate	—	Jabez Wright, Architect, Macclesfield	—
Longfleet—Infirmary Buildings at Workhouse	—	E. H. Parkinson, Architect, Old Branch Chambers, Bradford	—
Leeds—Additions to Moor-wood-road Council School	—	H. F. J. Barnes, Architect, Poole	—
Keswick—Residing Black Lion Inn and Cottage	—	W. S. Braithwaite, Architect, Calverley-street, Leeds	—
Hull—Villa, Newland	—	Jennings Bros., Ltd., Castle Brewery, Cockermouth	—

ELECTRICAL PLANT.

Northampton—Plant, &c.	Corporation	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton	Aug. 15
West Ham—Traction Switchboard, &c.	Town Council	J. K. Rock, Boro' Elec. Eng., Abbey Mills, West Ham	21
King's Heath, Birmingham—Electric Tramway (3 miles)	Urban District Council	C. H. Gadsby, Engineer, 20 Victoria-street, Westminster, S.W.	22
Hackney, N.E.—Arc Lamps, &c.	Borough Council	Robert Hammond, M.I.C.E., 64, Victoria-street, Westminster, S.W.	31
Fydney—Generating Set	N.S.W. Railway Commissioners	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Sept. 12
Launceston, Tasmania—Electric Meters (500)	Corporation	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	23

ENGINEERING.

Boskoop, Holland—Acetylene Plant	Town Council	P. A. Ottolander, Boskoop, Holland	Aug. 15
Northampton—Tramways Permanent Way	Corporation	A. Fidler, A.M.I.C.E., Boro' Eng., Guildhall, Northampton	15
Llandilo-fawr—Bridge over the River Garnant	Llandilo-fawr Rural District Council	Evan Jones, Surveyor, Glancwen, Llandilo	15
Selkirk—Concrete Service Tank	Town Council	H. W. Taylor, A.M.I.C.E., St. Nicholas Chambers, Newcastle-on-T.	15
Llandilo-fawr—Bridge over the Berrach Brook	Llandilo-fawr Rural District Council	Evan Jones, Surveyor, Glancwen, Llandilo	15
Birmingham—Bacteria Beds	Tame and Rea Dist. Drainage Board	John D. Watson, Engineer, Truburn, near Birmingham	17
Cheadle—Tramways Permanent Way	Cheadle and Gatley U.D.C.	C. R. Braby, A.M.I.C.E., 13, Warren-street, Stockport	17
Asterby, Horncastle—Re-building Bridge over Stream	Rural District Council	W. H. Holmes, Surveyor, 4, Church-lane, Horncastle	17
Nelson—Widening Canal Bridge, Scotland-road	Parks Committee	B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Nelson	18
Lynthurst—Sewage Disposal Works	New Forest Rural District Council	Bennett, Son, and Berry, Engineers, Southampton	18
Maesteg—Waterworks	Urban District Council	Joseph Humphreys, C.E., Engineer, Maesteg, Glam.	19
Barrow-in-Furness—Water-Tank at Workhouse	Guardians	J. M. McIntosh, Architect, Cornwallia-street, Barrow	19
Salford—Bevel Gears, &c., for Sewage Works	Corporation	The Borough Engineer's Office, Town Hall, Salford	19
Uxbridge—Ventilation and Water-Supply Works	Joint Hospital Board	J. Freehairn Stow, Engineer, Corn Exchange, Uxbridge	20
Rotherham—Boiler at Destructor Works	Sewage Committee	W. E. Warrington, M.I.C.E., Wolverhampton	21
Chartham Downs—Extension of Fire-mains at Lunatic Asylum	Kent County Asylums Committee	J. W. Jennings, Architect, 4, St. Margaret's-street, Canterbury	21
Newton-in-Makerfield—Reservoir (300,000 gallons)	Urban District Council	C. Cole Clerk, Town Hall, Earlestown, Lancashire	22
North and South Shields—Floating Landing Stages	Gas and Water Committee	James Gibson, Gas and Water Engineer, Leigh, Lancs.	22
Macclesfield—Laundry Machinery at Workhouse	Tyne Improvement Commissioners	Robert Urwin, Secretary, Beckett-street, Newcastle-on-Tyne	22
Highworth—Water-Supply Works	Guardians	Whittaker & Bradburn, Archts., 19, King Edward-st., Macclesfield ..	24
Manchester—Weighbridge and Lift at Electricity Station	Rural District Council	F. Bedman, Engineer, 34, Wood-street, Swindon	24
Llanwrst—Extension of Water-Mains	Electricity Committee	The City Surveyor's Office, Town Hall, Manchester	24
Clutton—Waterworks	Llanwrst Urban & Glynnydd R.D.C.	R. R. Owen, Clerk, Union Offices, Llanwrst	24
Burnley—Seven Sewage Tanks	Rural District Council	William F. Bird, C.E., Midsummer Norton, near Bath	25
Lynton, Devon—Waterworks	Corporation	G. H. Pickles, A.M.I.C.E., Boro' Sur., Town Hall, Burnley	26
Swindon—Tramways Permanent Way	Urban District Council	W. H. Chawins, Engineer, Town Hall, Lynton	26
Abergavenny—Carburetted Water-Gas Plant	Corporation	Lacey and Sillar, Engineers, 2, Queen Anne's Gate, Westminster ..	26
Devonport—Telescopic Gas-holder	Town Council	The Town Clerk, Town Hall, Abergavenny	26
Kempston—Sinking Shallow Well	Corporation	Sidney E. Stevenson, Engineer, Gasworks, Devonport	29
Devonport—Cast-iron Main Gas-Pipes	Urban District Council	Bayley, Son, & Nicholls, Engs., 11, Victoria-st., Westminster, S.W.	29
Belfast—Graving Dock	Corporation	Stevenson and Burdall, Engineers, 33, Parliament-street, S.W.	29
Hounslow—Steam Fire-Engine	Harbour Commissioners	R. Gordon Nicol, Engineer, Aberdeen	31
Southampton—Pumping-Engines	Harbour Commissioners	E. F. L. Giles, Engineer, Harbour Office, Belfast	31
Aston, Birmingham—Re-constructing Tramways	Corporation	H. J. Baker, Clerk, Town Hall, Hounslow	Sept. 1
Paddington, W.—Four Sweeping Machines	Horton and Isleworth U.D.C.	H. A. Crowther, A.M.I.C.E., 123 High-street, Southampton	1
Jassy, Roumania—Waterworks	Urban District Council	Robert Green, A.M.I.C.E., 37, Waterloo-street, Birmingham	3
Greenwich, S.E.—Four 5,000 H.P. Steam-Engines	Borough Council	E. B. B. Newton, A.M.I.C.E., Sur., Town Hall, Paddington, W.	20
Valletta, Malta—Lift Construction	Corporation	M. Pajano, Engineer, Technical Office, Jassy, Roumania	22
Cairo—Three Road Bridges over the Nile	London County Council	The Clerk, County Hall, Spring Gardens, S.W.	Oct. 6
Nottingham—Lancashire Boiler at Union School	Ministry of Public Works	The Receiver-General and Director of Contracts, Malta, Valletta ..	31
Rochford, Essex—Boiler	Guardians	The C. Intel. Branch, Board of Trade, 50, Parliament-st., S.W. (1904) Feb. 1	—
—	—	G. Muncester Howard, Clerk, Shakespear-street, Nottingham	—
—	—	J. Featherby, Bishop's Stortford, Essex	—

FENCING AND WALLS.

Pontypriidd—Retaining and Fence Walls (310 yards)	Urban District Council	P. R. A. Willoughby, A.M.I.C.E., Surveyor, Pontypriidd	Aug. 17
Gillingham—Brick Wall	Urban District Council	F. C. Boucher, Clerk, New Brompton, Kent	19
Portsmouth—Fence and Gates to Allotment Grounds	—	The Borough Engineer's Office, Town Hall, Portsmouth	19
Leeds—Fencing over Culvert, Cross Stamford-street	—	The City Engineer's Office, Municipal Buildings, Leeds	19
Manchester—Setting-back Entrance Gates at Cemetery	Parks Committee	The City Architect, Town Hall, Manchester	19
Penrith—Dry Stone Wall (116 rods)	Rural District Council	Thomas Watson, Surveyor, Kirkoswald	21

FURNITURE AND FITTINGS.

Rustington—Furniture, &c., to Millfield	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Embankment, E.C.	Aug. 17
Burnley—Furnishing Hareher Clough Council Schools	—	A. J. Shaw, A.R.I.B.A., and T. E. Vowles, A.R.I.B.A., Burnley ..	23
Fudsey—Re-seating Wesleyan Chapel, Church-lane	—	Danby and Simpson, Architects, 10, Park-row, Leeds	—

PAINTING.

Crewe—Street Lamp Columns (700)	Electric Lighting Committee	H. H. Denton, Electricity Works, Elton-road, Crewe	Aug. 15
Mansfield—Post Office, Market-street	Corporation	R. Frank Wallace, Borough Surveyor, Mansfield	17
Glasgow—Crosshill and Govanhill District Library	Corporation	G. B. Walker, Measurer, 65, Bath-street, Glasgow	17
Llandilo-fawr—Parish church	Urban District Council	David Jenkins, F.R.I.B.A., Architect, Llandilo	19
Wellington—Office, House, and Outbuildings	Mrs. E. Bashforth	G. Riley, Surveyor, 45, Walker-street, Wellington, Salop	19
Wombwell—Six Houses, Hough-lane	Guardians	A. B. Linford, Architect, Carlton Villa, Wombwell	20
Leeds—Union Infirmary, Beckett-street	Rural District Council	James H. Ford, Clerk, Poor-Law Offices, Leeds	21
Pershore—Jubilee Bridge	Urban District Council	W. Bullcock, Surveyor, Wick, Pershore	25
Northfleet—Fencing (700 yards)	Urban District Council	J. Honeycombe, District Surveyor, Council Offices, Northfleet	25
Northfleet—Cemetery Buildings and Council Offices	Urban District Council	T. Clement Williams, F.R.I.B.A., 29, Southgate, Halifax	27
Halifax—Block at Gibbet-street Workhouse	—	T. Trevor Williams, Surveyor, Alexandra-road, Swansea	—
Swansea—Smallpox Hospital, Garmgoh Common	—	W. H. Jowett, Craig Vale House, Morley	—
Morley—Market Hall	—	—	—

PLUMBING AND GLAZING.

Dundee—Extension of Offices, &c.	Gas Commissioners	Alex. Yeill, Engineer, Gasworks, Dundee	Aug. 15
Glasgow—Crosshill and Govanhill District Library	Corporation	G. B. Walker, Measurer, 65, Bath-street, Glasgow	17
Portsmouth—Plumbing Work	Corporation	A. Hellard, Town Clerk, Town Hall, Portsmouth	23

ROADS AND STREETS.

Southend-on-Sea—Making-up Streets	Corporation	E. J. Elford, M.I.M.E., Borough Surveyor, Southend-on-Sea	Aug. 17
Balgray—Streets, &c.	James Lindsay	Gilbert Thomson, C.E., 161, Bath-street, Glasgow	17
Romford—Roadmaking	Rural District Council	E. G. Boden, Surveyor, Victoria Chambers, Victoria-road, Romford ..	17
Halifax—Private Improvement Works	Halifax Corporation	James Lord, C.E., Borough Engineer, Town Hall, Halifax	17
Basford, Notts—Widening Road	Rural District Council	Geo. W. Hawley, Surveyor, York Chambers, King-st., Nottingham ..	17
Leatherhead—Road Improvements	Urban District Council	T. Salkield, Engineer, Council Offices, Leatherhead	18
Wimbleton—Tar-Paving Playgrounds, Dundonald-rd, Schools	Education Committee	Thomson and Pomeroy, Architects, Hill-road, Wimbleton	19
Barnsley—Works, New Bridge-street	Town Council	J. Henry Taylor, M.I.C.E., Boro' Sur., Manley House, Barnsley ..	19
Manchester—Setting Back Gates at Philips Park Cemetery	Parks Committee	City Architect, Town Hall, Manchester	19
Wimbleton—Tar-Paving Playgrounds, Queen's-rd, Schools	Education Committee	Thomson and Pomeroy Architects, Hill-road, Wimbleton	19
Paddington, W.—Making-up and Paving Landerdale-road	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	21
Tatam Brow—Diverting Highway	Boatle Rural District Council	John Clark, Broughton-in-Furness	21
Paddington, W.—Making-up and Paving Biddulph-road	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.	21
Bushey, Herts—Widening Aldenham-road	Hertfordshire County Council	Urban A. Smith, County Surveyor, 41, Parliament-street, S.W.	21
Stamford—Making-up Streets on Northfields Estate	—	T. W. Hayward, A.M.I.C.E., 8, St. Mary's-street, Stamford	21
Stevenage—Leveling, &c., Basils-road and Grove-road	Urban District Council	Wm. Goslow Times, Clerk, U.D.C. Offices, Stevenage	24

THE BUILDING DEWS, AUG. 14, 1903.



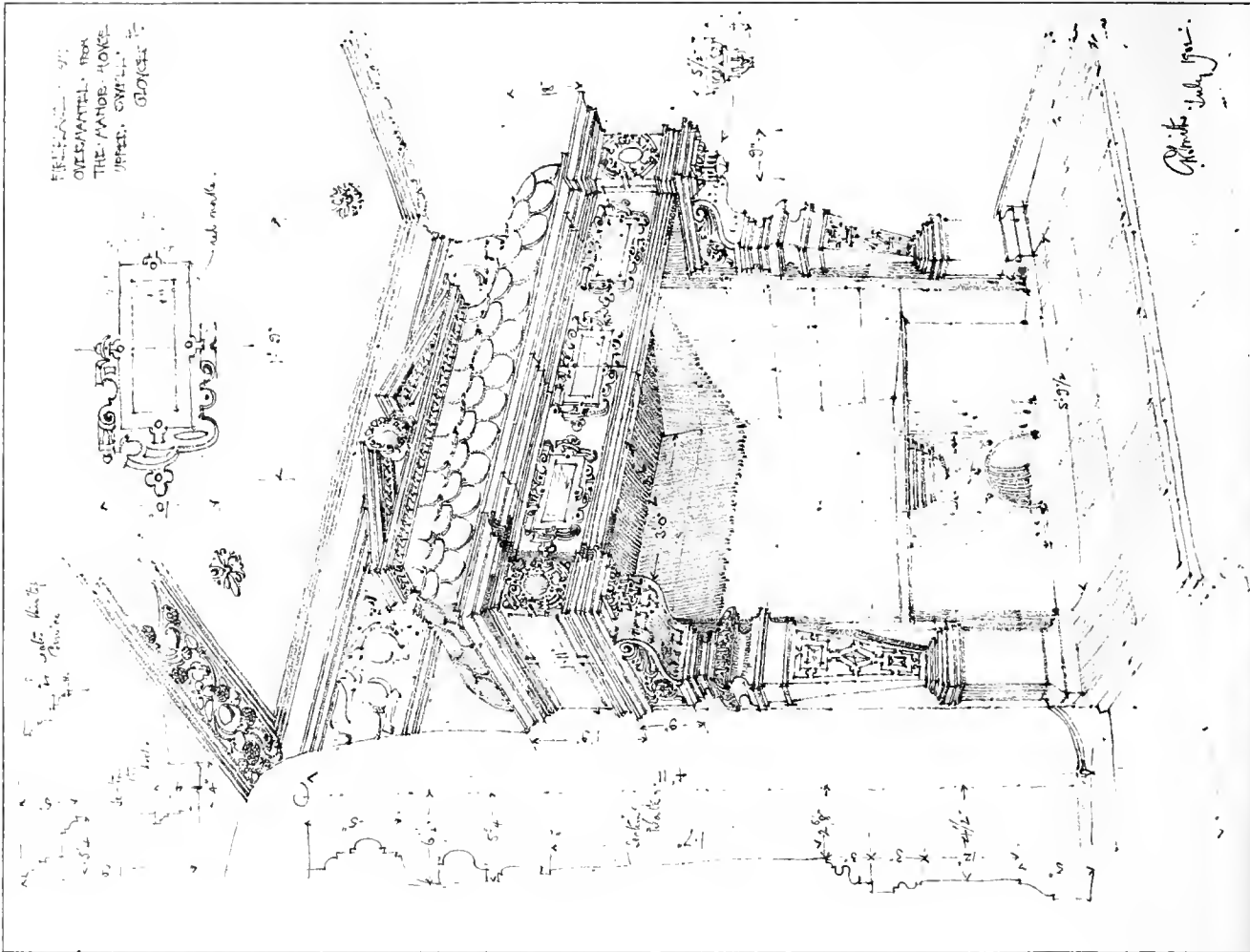
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Architects Aug 03

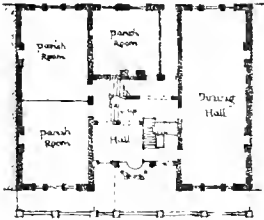
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Architects July 1903

KIND FOR IN TRAVELLING JOURNAL. DRAWING. W.C.

DESIGN FOR A CLERGY HOUSE



Ground Plan
one inch equals 24 feet

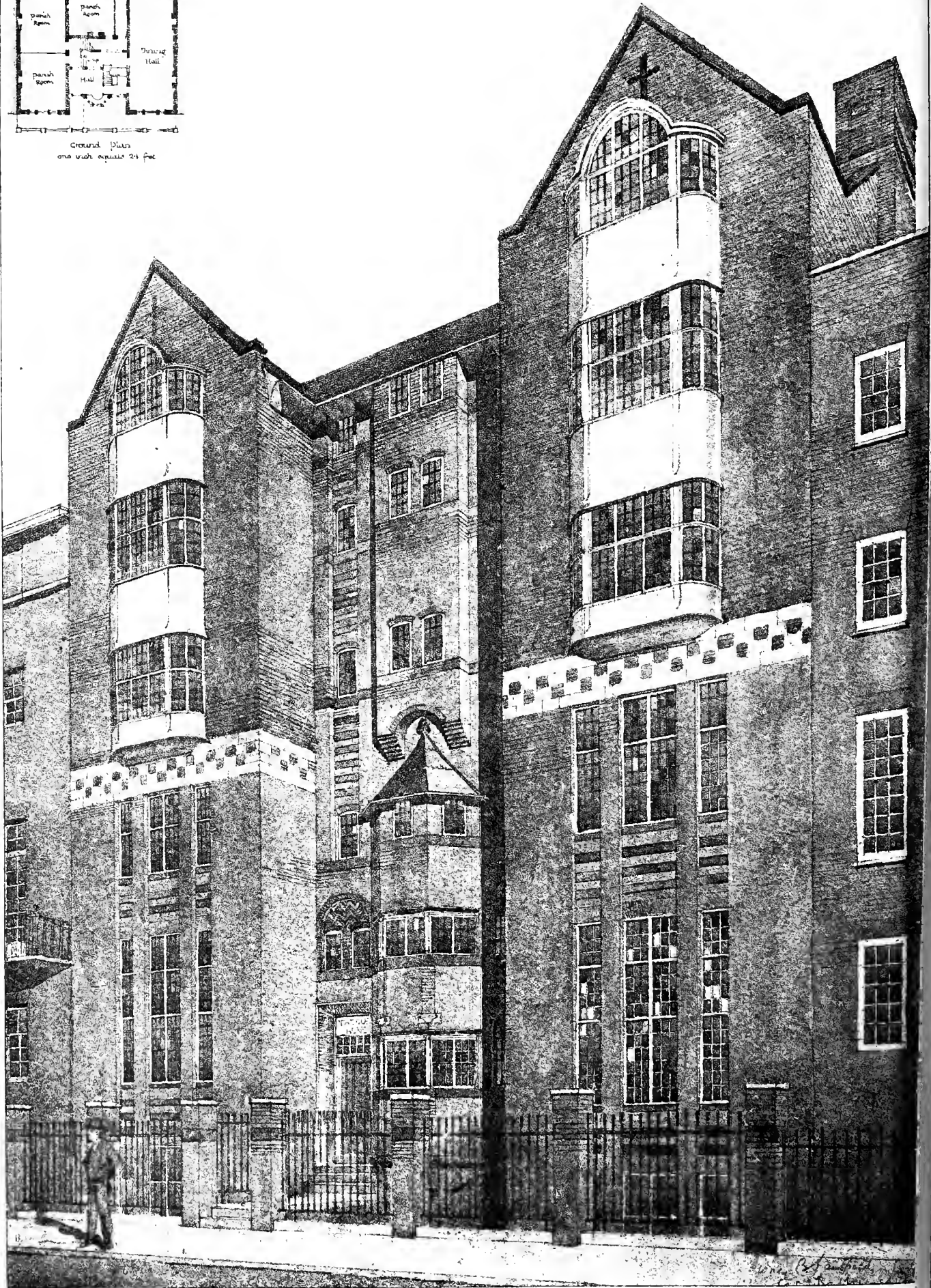
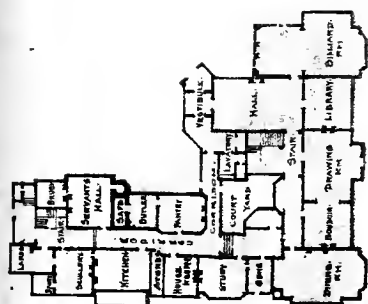


PHOTO-TINT by James Akerman 6 Queen Square London W

PROPOSED CLERGY HOUSE · SIDNEY B. CAULFIELD ARCHT

HOLLINGTON HOUSE

ARTHUR C. BLOWFIELD ARCHT



PLAN.

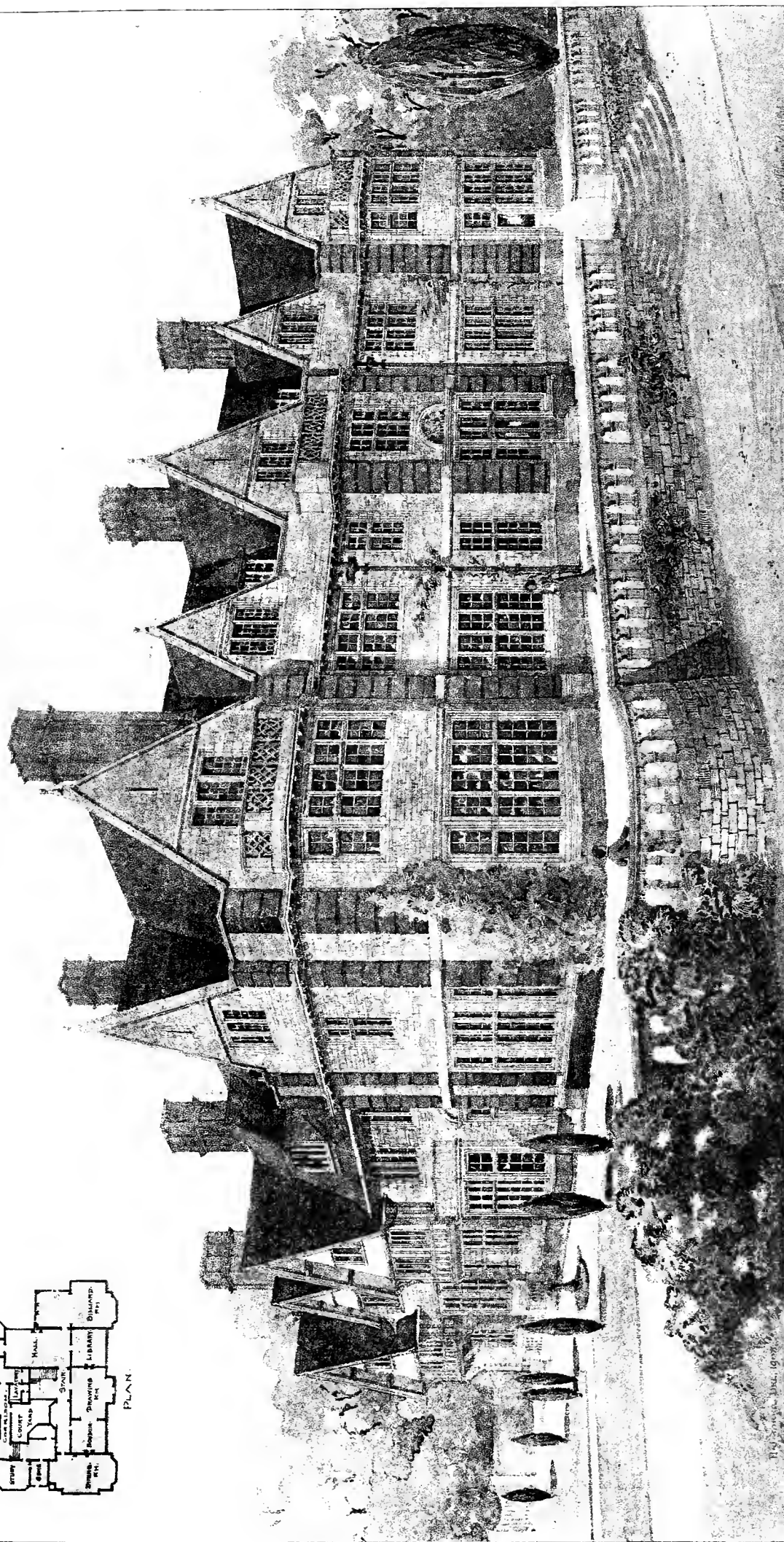


PHOTO TINT BY JAMES H. BROWN

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PREPARATORY PROFESSIONAL WORK.

IN the earlier stages of building operations a good deal of a preparatory nature has to be considered by the architect, and it is necessary to come to this task with some knowledge of requirements. There is first what we may term the negotiable stage, in which the architect has to deal with land-owners, lessees of various kinds, various easements, by-laws, and regulations of local authorities—all very important matters. Business tact and legal qualifications are necessary in the transaction of these preliminary duties. Not many architects are capable: they have not had the training; controversial business questions are quite foreign to them. The man who can make a bargain, who is clever at compromises, is the sort of individual that will succeed. Let us see for a moment the kind of transactions to be conducted. The building owner wants to purchase land for building, and the architect has to approach the land owner or his surveyor. The terms are everything, for it would not answer to purchase land at a price which would render building on it unremunerative. The architect, representing his client, cannot advise him to purchase land without knowing the conditions; it may mean many thousands for an area of land which will be reduced considerably after the requirements by the local authority are met; for instance, they may require a roadway to be formed on one side of the site necessitating a curtailment of area, or even the widening of an existing road which the ground landlord or his surveyor has not said a word about; but such astuteness is only a matter of business. On the other hand, the architect who is acting for his clients ought to be acquainted with these restrictions; he ought to be able to ascertain how much area there is really available for building, whether there is any easement to be satisfied, what drainage is necessary, what the soil is like, and other matters as to the kind of business likely to be carried on in the neighbourhood, the eligibility of the land for residential purposes;—all these are questions which ought to be in the mind of the professional adviser before he can advise his client to embark on any building speculation. These points may make a considerable reduction in the value. Even the formation of a road will cost something, besides reducing the area for plots; and the architect ought to be able to say roughly what a road of macadam will cost of a certain width. He must be prepared with a price for a certain width, say, 30ft., which will amount to, say, 20s. to 40s. or more a lineal yard, according to its construction. An architect is sometimes employed to make a plan for new business premises, or to suggest an improvement to old premises; but it would be unsafe for him to sit down and prepare a set of drawings for building or for additions without making preliminary inquiries. The client, if a business man, may know what his liabilities as a leaseholder are—whether there are any easements of light to respect, what his neighbour's rights are; but the architect is expected at least to make himself acquainted with them. Here at least his powers as a negotiator may come into play. His plans now an addition to the old building which could considerably lessen the light that now comes over it to an opposite or adjacent building which may have rights of light, and

his only course to avoid an injunction to restrain is to consult with the owner of the dominant tenement and endeavour to make terms that will be agreeable. He ought to be prepared to tell his own client what compensation or annual payment in the form of rent should be paid to the dominant owner or is reasonable, and for this purpose negotiations must take place between the servient and dominant tenement owners as to an agreement or the payment of a sum of money. By thus acting in time an action for damages may be stayed, or a mandatory injunction refused. The Ancient Lights Bill to amend the law relating to easements of light, which was read a first time in the House of Commons last session, will, it is hoped, form the basis of all future negotiations. We have lately drawn attention to the main provisions of this Bill, one of which is that the owner of a building intended to be taken down and rebuilt has to prepare plans, sections, and elevations of such building, which must be certified by the surveyor as to their correctness. This is a duty that will devolve on the architect. The certificated plans will be evidence of the correctness of the survey, and will establish beyond doubt the exact positions of all windows and heights. The dominant owner will be given facilities to inspect such plans, so that he may be able to make any objections, or state the terms on which he will permit the servient owner to erect his building. Here the obligations of the architect of the dominant owner will be called into operation. He must be prepared to point out any objections to the design of the intended building, which will entail a careful examination of the drawings certified—a responsible duty; he must be able, if necessary, to negotiate the terms of agreement, to state any alterations necessary to be made in carrying out the building or alteration, or be able to give some opinion as to the amount of compensation to be paid to his client. Or the matter may be carried to arbitration, in which case these questions will be determined, the compensation agreed to, and the costs to be paid by either party. But before any reference is made to arbitration, the architect of the servient or dominant owner may recommend to his client a way out of the difficulty. He can suggest, for instance, alterations in the plans, light-reflecting surfaces, or other means to lessen the obstruction to light, and thus avert the resort to arbitration. These are matters that the architect on either side can do much to control. Only a qualified architect will be able to inspect the plans and sections of the servient owner, and to advise his client to accept, or otherwise, the terms offered. Every client, whether he be a servient or dominant owner, must to a large extent depend on his professional adviser's opinion before he accepts or rejects the notice. After the negotiable stage is passed, another preliminary of building is to make calculations of value and cost. In this duty the knowledge and capability of the architect are tested. Many otherwise excellent designs and schemes are rendered failures by inattention and neglect of these essentials. How many commercial undertakings come to grief because of a miscalculation of the outgoings or cost of building, of the over-estimate of the net income after deductions have been made? Occasionally the fault is that no allowance has been made for capital outlay upon essential repairs or alterations, as in the case of the valuations of shop property. The gross value has been set down without deducting for necessary alterations. It will be said these are matters outside the real architect's duty, which is simply to prepare designs for a new building, and that the client is answerable for any error in judgment as to his business. In a few instances this may be true, as when the architect receives instructions to prepare a design without limit as to cost;

but in most businesses the question of profit enters largely in the scheme. Its remunerativeness is an element the architect is required to keep in view, as in the erection of a number of houses, flats, offices, or shops, or large commercial premises. The return upon capital expended is regarded as important. The purchase value of an estate for building will depend on the number of houses or tenements which can be built on the land at a yearly ground rent. If the area has not been economically planned, the value will be less; or the designer may perchance have not taken into account the cost of formation of roads and sewers at a sufficient sum, which may make a great difference. On these matters the architect is at least expected to exercise knowledge and judgment in the preparation of his scheme. A calculation of cost must be made in some such way as this: we must first set down a sum for cost of formation and sewers, and legal expenses. Then to this sum we must add the interest on non-productive capital sunk in developing the property to take a term of years, say, at 5 per cent., deducting the contribution of purchasers towards sewers, &c. Adding the cost of land we get a total sum representing it, and the cost of developing the same, which must be deducted from the estimated income derived from the capitalised ground rents, which will give the total value of estate allowing for risk and losses. The promoters of many new building estates under-rate the cost of formation and sewers, the losses sustained by not getting in the contributions of purchasers towards the sewers, legal, and other expenses—all of which have to be set against the income derived from the ground rents. There is an eagerness to make a beginning before the estate has been developed, to get builders to erect; but the rest of the estate does not go off. Again, in the valuation of land let on lease, of which term there is some years to run, judgment is necessary in considering the prospective increase of rental at expiration of lease, or a fair valuation cannot be made; to do which, of course, it is necessary to capitalise a sum deferred so many years to add to the value upon basis of existing rental. Valuations of this sort are perhaps more the business of the surveyor than the architect; but the work of the latter is so mixed up with commercial business, and schemes of building and improvement are so entirely dependent on correct valuations, that the architect at least is expected to bring to his duties as adviser a practical knowledge of valuation of estates and buildings.

Before the design for a building can be finished preliminary calculations as to cost are essential. In large contracts the bill of quantities becomes the proper means of ascertaining the cost of a building; but this has to be prepared on the basis of a specification, which should define the materials to be employed, and the class of work to be executed. The architect must necessarily determine what these are to be. It is the custom now to leave a great deal to the surveyor—a practice which may have something to commend it in certain things; but the question of determining the kind of material and items ought to be left to the architect. In a well drawn up specification there will be no difficulty as to the materials to be used in the several trades, and the particular goods specified, fittings, and decoration ought to be clearly stated. The client may have a preference for particular fittings or wall-papers, and the architect must be prepared to advise in these matters. Consultation with the employer on these subjects at the onset will save much trouble and vexation during the progress of the work. If the building is a technical school, library, or hospital, the architect ought to consult those who have special knowledge of the require-

ments before he specifies the fittings; as a matter of fact, they are often left to a later stage, after the specification and quantities have been prepared.

At no stage of professional work is preparatory study more necessary than that of the design itself. Previous training and experience may be said to culminate at this period. The architect has to bring the full equipment of his knowledge and studies to the task; the duty of thinking over the problem, how it is to be best accomplished and the client's wishes to be carried out. How many designs are ruined by a want of preparation or study! A commission is given for the design, say, of new business premises; the architect, without any previous preparation or thought on the subject, sketches out a plan like something else of a similar kind, submits it to his client, and sets to work to prepare the drawings. There is no time to study or think over the subject, to examine other works, or to consult with experts about it—it has to be done or declined. This is the modern way of conducting business. It is working at high speed. After the building is finished, often before, defects and omissions appear, the client discovers mistakes of plan, complains of the want of convenience in some parts, of serious omissions which have to be made good; but remedies are now impossible, and any serious mistake has to be altered at great expense. The error is in not considering it worth the time to think over the subject, to consult the client, and to inspect buildings of a similar kind before committing the design to paper in a final form. A week or more, if necessary, spent in consulting others, or studying existing examples, before making a plan, is always well worth the delay. It is quite impossible to bring one's mind to a subject that is not familiar all at once. Memory is apt to be defective, and some point very important is overlooked. The problem must be turned over and over in the mind after consulting examples, before it is possible to see the question in its true light. There are some architects who depend largely on precedents; volumes of professional journals are consulted, every plan that has been published of schools, or hospitals, or libraries, and baths, is hunted up—a very good means of refreshing the memory as to points of arrangement and details, if accompanied by other more direct means of obtaining information. What are these? One is to consult the client; to try and make oneself conversant with his requirements and wishes. In the design of a house or business premises this course is the most direct. The architect is at once put on the right track; he knows what his client wishes in respect of accommodation, size of rooms, or details of the business. There is a good deal that the architect must find out by question, by familiar and confidential chats, as to mode of living, the tastes and hobbies of the client; if he keeps company, the class of trade and the like; and such intercourse is the only way the professional man can understand the real and family life of his client or his habits and business. Clients are often very reticent about their private life and habits: their instructions are given in a crude and perfunctory manner, so it is the architect, if he wants to get beneath the crust, must try to feel his way. Then there are clients who are quite unable to express their wants in an intelligible manner without being drawn out, as it were, on many points. They have no knowledge of building, they cannot "read" plans and technical drawings, and the architect's difficulties are thereby increased. There are others who take their knowledge second hand; they can only point to some example of the building they require. They have no definite ideas of their own, and therefore they must trust entirely to their architect finding out what they really want. Few in the profession have the patience to

investigate the subject in this way. The majority of architects put the rough ideas of their clients into shape without any further trouble, and the consequence is there are many alterations to make after the drawings are prepared. Of course, these relate to planning and details chiefly. Another course open to the architect to obtain information is to consult experts or experienced men in the class of building proposed. This would apply to commercial buildings, factories, workshops, and to the special requirements of schools, hospitals, libraries, and the like. In the preparation of drawings for a large shop or business premises, where steel and iron-work are largely employed, much valuable time will be saved if the architect consulted a competent structural engineer before he finished his drawings, so that the depth of floor, the size of main girders and steel beams, columns and their connections, might be ascertained. Or if there is much terracotta, the manufacturer ought to be immediately consulted, so that the large pieces and blocks required for details should be at once put in hand. For this purpose careful drawings to a large scale should be made of the elevation, and every block numbered, and every ornamental or moulded block must be drawn in detail to a scale, allowing for shrinkage in burning. From the neglect of these preliminary precautions many terracotta buildings have been spoiled by the unequal size of the pieces, and the crooked and uneven lines of the mouldings. Considerable delay in building has been caused by inattention to the early putting-in-hand of details for iron and steel work, terracotta, and special stonework. These are the architect's duties, and he should allow himself sufficient time for the preparation of these details before the contract is signed. A great deal of the architect's time is also taken up in preparing for foundations, shoring of buildings where the foundations are of a treacherous kind. In the other class of buildings we have mentioned expert advice is also essential. The practical schoolmaster or librarian is enabled to give the architect useful advice on a number of details relating to lighting, size of desks and seats, the fittings of libraries, the position of lifts, stocking books, supervision, which no treatise will give. The nursing staff or hospital specialist ought to be consulted in infirmary planning and equipment before the large-scale drawings are finished, so that any little correction may be made. In these and similar buildings of a specialised class the architect cannot afford to rely too implicitly on his own general knowledge or book studies. Technical construction of various kinds is too large a field to discuss here. Take, for instance, the different floors used in fire-resisting construction. The architect must have time to think the matter over, to determine which system he ought to adopt, and to consult his client. It may be necessary to test the strength or deflection of the system used, and these preliminary investigations take thought and time. Then the application of steel and concrete to various kinds of domes, staircases, cantilever construction for theatres, cannot be done in any perfunctory manner. Preparatory studies and inquiries must be made before details can be drawn out. These and a hundred other subjects demand preliminary investigation before the architect can safely venture to adopt or specify them, and these investigations entail inquiries, visits to manufactories and workshops, consultations with engineers and others, tests, &c. Next, of course, though less direct as a source of information, is self-study through books. A great deal has to be learned in this way, such as elementary laws of physics, the principles of measuring force or stress by graphical means, the elements of manufacture, chemical processes, and the like. Treatises and books on the planning of hospitals, workhouses,

theatres, libraries, baths, &c., teach, as a rule, what to avoid and what to aim at; but reliance cannot be placed on such means of information, as they are often based on imperfect data, and the men who write books are in the habit of giving second-hand information in such a general way that it cannot be applied to any particular case in hand.

MEASUREMENT OF OBSTRUCTED LIGHT.

OBSTRUCTION to light assumes every conceivable position or attitude in relation to windows in buildings. It is either in front of the "ancient light" or a little on one side, intercepting the sun's rays directly opposite to or obliquely to the aperture. The obstructing building or wall may be parallel to the premises obstructed, obliquely inclined, or even at right angles to it. And the light is intercepted in a variety of ways, according to the position of the sun. Writers on the subject have devised ingenious ways of ascertaining the measure of obstruction. One recent authority, Mr. Henry Bridges Molesworth, M.Inst.C.E., in his treatise, "Obstruction to Light," has dealt with the question from a strictly mathematical point of view. He points out that most authors have used diagrams to illustrate their remarks which neglect the effect of vertical perspective; in short, taking a square window of nine squares or panes, the centre one being the position of the eye, say a foot from the window, he shows that it should be represented by curved sides bulging outwards, the centre pane nearest to the eye being the largest, covering more of the field of vision, the lines of sash-bars above the eye receding to a vanishing point downwards and those below it curving upwards. Vertical lines to right and left will similarly meet in a vanishing point above and below. In fact, as he writes, what is required is the projection of the object on a surface equidistant at all points from the point of vision—a condition fulfilled by a spherical surface of which the point of vision is the centre. His method is to plot the shape of any building upon a diagram or planisphere having circles of bearing and parallels of altitude, so that the angular position of any point can be plotted easily. His theory is to assume the eye of the observer as being the centre of a hollow transparent sphere, the sun's path, and the position of the obstructions being plotted on the surface of the sphere. The theory is sound, and the method of plotting on a planisphere is more accurate certainly than the method adopted on the diagrams of many authors. But it is not our object now to explain this method in detail; we would refer the reader to the book and the graphic methods used which can be acquired by any architect or surveyor.

The many kinds of obstruction to light call for a method of finding out the actual obscuration of lights in certain cases. The question which has so often to be answered in the courts of law is "What damage the plaintiff in an action of this kind has really suffered?" and this cannot be ascertained with any degree of accuracy or satisfaction, unless the actual amount of obstruction is found. At present, the methods used for the purpose are not satisfactory. The surveyor or expert can only view the premises alleged to have suffered, and try to find out from frequent visits how much the obstructing building has affected them. But as the position of the sun is always changing, and is different at various times of the day and year, the amount of obstruction is difficult to ascertain. These conditions make it almost impossible to find out the real effect of a new building. But the actual quantity of light obstructed has not been a point with lawyers. The question

has turned more on the right of the dominant tenement owner to such an amount of light as is reasonably necessary for the comfortable use and enjoyment of the dominant tenement, or for its beneficial use as a place of business, and the proposed reform in the law, Part III., establishes this view, for it enacts, after the commencement of the Act the owner of a dominant tenement shall be "entitled to such an amount of light passing over the servient tenement as is reasonably necessary for the comfortable use and enjoyment of the dominant tenement if a dwelling-house, or for its beneficial use and occupation if used as a place of business, or for any other purpose than a dwelling-house, and he shall not be entitled to any extraordinary amount of light necessary for any particular purpose, trade, or occupation." But the section does not apply to a tenement in which a trade or occupation requiring an extraordinary amount of light has been carried on for ten years. Questions are usually settled on the legal point as to whether the plaintiff's light was "ancient" or not, without much reference to the amount obstructed. A case establishing this view has just been concluded in the Chancery Division by Mr. Justice Farwell in "Barr v. The City and Suburban Electric Carriage Co., Ltd." The action was for an injunction and damages brought by plaintiff for the obstruction of an ancient light. Barr was lessee and occupier of a block of buildings, and he carried on the business of builder and decorator. The premises consisted of a cottage, with a builder's yard and workshop behind. The plaintiff had the premises for a term of 7½ years from Midsummer, 1900, and the light obstructed was in the ground floor, and the room was used as a painter's shop, where paints were mixed and matched. It was alleged the defendants had built a wall only 12in. away from the plaintiff's premises on the south side, and this wall was only that distance away from the window in the painter's shop. The defendants' ground was higher than the plaintiffs, and the top of the defendants' wall was 2ft. 5in. above the window. For defendants it was urged that if an ancient window was established the plaintiff was only entitled to very small damages. The counsel for the plaintiff referred to defendants' second wall, which was farther off than the one within 12in. of the plaintiff's premises and parallel with it; but it was argued that if the nearest wall was not there, there would be some obstruction to the window from the further wall. From the statements made by the plaintiff's counsel it was alleged that the former lessee (Mr. Leggett) lived close by, and that when he first had the workshop this particular window did not exist in 1878. He had used this shop as a kitchen and living room, and in 1878, in order to make the room suitable, made the window to have a good light. This fact was borne out by evidence, though the defendant stated the window was made within the last two years. It was very important for the plaintiff to have a good light in the painter's shop, and evidence was brought forward to show that since the obstruction the shop could not be used for mixing and matching colours, and the plaintiff had to make other arrangements, and he used one of a suite of rooms at Chelsea, which was let for 16s. a week, for the purpose. An injunction was asked for, and a small amount of damages. He asked for a mandatory injunction with regard to the nearest wall, and submitted there was also material obstruction from the further wall. His lordship held that the plaintiff's light was "ancient," and granted the injunction with regard to the nearer wall, and awarded plaintiff also £23 13s. damages. Judgment followed with costs. It is difficult from the report to understand exactly the relative positions of the two walls, which were parallel to each other; but a wall only 12in.

away from a window and 2ft. 5in. above it would, of necessity, very materially obstruct the light, to say nothing about the more distant wall. The issue was decided upon the fact that the light was ancient. But the proposed reform in the law will not do anything to alter the issue of a case like the one mentioned: every dominant owner will be entitled as heretofore to a certain amount of light passing over the servient tenement that may be reasonably necessary for the "beneficial use and occupation of a place of business," but he will not be entitled to "any extraordinary light." How that term is to be interpreted we hardly know; but at least the obstruction caused by a wall a few inches before a window will be amenable as now to the law. Sub-clause 3, which we have quoted, refers to premises in which a trade requiring an extraordinary amount of light has been continuously carried on for ten years. A painter's shop for matching colours for wall-papers may be said to come under this category, and therefore can claim a greater degree of light. We do not discuss this moot question now, but desire to point out that the dominant owner of premises ought to be protected by the most careful means available of measuring the amount of obscuration, while the servient owner should not be compelled to pay more than a fair amount of compensation for the raising or enlargement of his building. The limitation of the amount of light received by a dominant owner is one of the main objects to be attained in an amendment of the law, as the effect of the present law has been to hamper and impede building improvements by the threat of injunction and heavy compensations. In the future the claim to an "ancient" or prescriptive light will not carry with it the heavy penalties which are often the result of infringement; but the chief question will be the amount of light actually obscured in a given trade or business. There have been decisions which have conferred on the owner of the dominant tenement a greater amount of light than he possessed previously without any reference to the particular trade or business carried on. In this manner the servient owner has been subjected to considerable interference and expense. To secure justice to the servient tenement owner, the actual measurement of the light obscured should be the basis of action.

ON BUILDING TIMBERS.—XXXIV.

OAK.

OAK—*Quercus alba*, the "white oak," so called from the colour of its bark which is whitish grey—is found growing from Southern Maine to South-west Quebec, through Central and Southern Ontario, the lower peninsula of Michigan and South Minnesota, South-east Nebraska, and Eastern Kansas, and it ranges south to North Florida and Texas. This tree grows to about 100ft. high and 6ft. in diameter, retaining all through the winter its dead and withered leaves; its wood is hard, tough, and durable, the colour being a medium brown, with light sapwood. A cube foot of heartwood weighs about 46lb. On radial sections the medullary rays may be seen arranged irregularly in broad plates, giving that handsome grain so peculiar to oak; they are also seen as well-marked lines on a transverse section, reaching in some cases from the pith to the bark of the tree across annual rings, which are seldom concentric, being more or less wavy, and differing in this respect from pines and other conifers, the rings of which are usually arranged as concentric circles of even width round the central pith. It is fortunate that a description of the various oaks found growing in America in no way enters into the scope of this work, for there are no less than two hundred varieties growing in the United States alone. Enormous logs of "American oak" are brought into this country, chiefly from Canadian ports, the States usually sending oak over in boards and planks, quartered or otherwise. When Canadian oak is opened the freshly-cut surface

shows a pinkish tint peculiar to this wood, and by which it may be distinguished from the oak of other countries. The logs, which are squared, show a good deal of rotten heart, when very large, and the shakes are sometimes so large and so numerous as to make it almost an impossibility to convert the wood without wasting one-half of it.

A common defect in American oak is a twist in the log, which makes the wood quite useless for joinery. This fault is easily seen, for the wood "checks" or cracks in drying along the lines of the medullary rays, and these cracks may be seen ranging in continuous lines along each side of a twisted log, not parallel to the edges as they should be, but running across the wood in an oblique direction. In straight-grown timber, when a log is squared the medullary rays, and consequently the minute cracks, due to seasoning or drying, will all run parallel to the edges of the log. Any joinery made from a twisted piece of timber will "wind" in the work, and as nothing will keep it straight, such wood is worse than useless. Canadian oak logs are usually sold here at from £3 10s. to £6 10s. per load; common lengths are from 35ft. to 60ft., and the squares from 13in. up to 42in. The value of the timber will depend on its size and condition, large sound logs being the most expensive. As these are 50c. ft. to a load, it will be seen that the wholesale price of American oak ranges from 1s. 5d. to 2s. 7d. A fair price for such oak in sills would therefore be (material only) 2s. per cube foot, as small scantlings only are used. Oak from the United States, 1½in. and 1¾in. thick, quartered and dry, is worth wholesale (net) from 2s. 8d. to 2s. 11d. per cube foot. The same oak cut "basted" is worth from 1s. 10d. to 2s. per foot up to 1½in. thick. Prime planks 5in. thick by 14in. up to 18in. are worth from 2s. 4d. to 2s. 5d. per cube foot. Builders generally pay 1s. per foot superficial retail for "wainscot" oak in the inch. Merchants buy American quartered oak in the inch at from 2½d. to 2¾d. per foot, and ¾in. as low as 1½d. Architects should therefore see that when they specify "wainscot oak" they do not get stuff worth only one-fifth as much. In fact, the difference in the value of American quartered-oak boards and Odessa wainscot is even more than this, for the latter are of irregular shapes, leading to much waste in some cases, whilst the former are parallel-sided, and can therefore be used without much waste. A builder who pays 1s. per foot for wainscot oak in the inch will find that it has cost him 1s. 3d. or 1s. 4d. in his joinery owing to waste. An American quartered board will cost him only the odd 3d. or 4d. under similar circumstances. The use of the term "wainscot" in describing oak will assuredly lead some day to one of those disputes lawyers are so fond of, for, What is "wainscot"? and What kind of oak is "wainscot oak"? Wainscot is the panelled woodwork which is fixed against the walls of a room, and which covers these walls from the skirting to the ceiling cornice. Along Hatton Garden, and in many other parts of London built about the same time, all the houses are wainscoted from floor to ceiling in the entrance halls and best rooms. The wood used is, however, seldom any other but pine—not yellow from Canada necessarily, but Memel or Riga yellow cut from logs, called at that time "deal." It must not be forgotten in this confusion of names that when Memel or Riga "fir" was sawn into boards it ceased to be "fir" and became "deal." Deal wainscot was always fixed with very wide panels, which were glued up in several widths. The "sweating" of the stone or brickwork behind these panels softened the glue in the joints, and the latter soon gaped open when the boards shrank. To prevent this, some joiners put charcoal behind the panels, others put wool, whilst a paint made of white-lead, Spanish brown, and linseed oil smeared all over the back of the woodwork was probably the commonest preservative used, as well as being the most efficient. In passing, it may be of interest to note that this wainscoting was measured by the superficial yard in this way—a piece of string was fixed to the top of the wainscot, and this was carried along vertically on the face of the panels and rails, and pressed into the mouldings, so as, in fact, to girth the work from top to bottom; the length of this string gave the width of the wainscot; the length was obtained by measuring with a string all round the room horizontally in a similar manner; but some joiners did not girth the mouldings for the last dimension: they measured the "circumference" of the room with a rule or rod. All

openings were deducted, and shutter fronts, doors, and other joiner's work wrought both sides were reckoned as "work and half." Cornices, dado rails, skirtings, and all moulded work planted on the wainscoting were measured extra by the foot. Chimney-pieces were also paid for extra, the framing and panelling only being priced as wainscoting unless a price per yard was given at first by what the firms of that time called the "Great," that is, inclusive of all such extra work. "Norway oak" was used for wainscoting, the workmanship costing in London 2s. per yard (in the country it cost twice as much), labour and material 6s. to 7s. per yard. Plain square deal wainscoting labour only 1s. per yard; labour and material 3s. 6d. per yard. In old price books, Norway oak, wainscot, deal wainscot, "Dissection" wainscot (probably what we call bolelection moulded work), and wainscot of Dantzic "stuff" are all mentioned in the compass of less than a quarter of a page; but there is no clue given as to what kind of wood is meant by Dantzic "stuff," for Dantzic exported pine as well as oak at that time (1726). It is obvious from all this, the term "wainscot" did not define any particular kind of oak. In fact, wainscot might be "deal" or any other wood. Another name was used merely to signify a framing and panelling which covered the wall of any room from floor to ceiling. A hundred years later (1826) "Framed Wainscoting" is defined as thin "deal" partitioning, which is to be girthed with a string in measuring, as already described. Subsequently, in the same book, "Dutch wainscot" is described as "Dutch oak," of the same species as our English or Irish timber, but of a lighter quality, and the grain of the wood "far more interesting, inasmuch as it induces manufacturers in many parts of the kingdom to connect it with articles of household furniture, which in the castellated mansion and the *cottage ornée* is extremely appropriate." Further on it is said that the Dutch oak or wainscot is made use of for various purposes, but chiefly in sashes of different descriptions, and in cabinetwork for libraries, morning-rooms, and reading-rooms, its prime cost being three times that of "fir" timber or "deal." Here "Dutch oak" and "Dutch wainscot" are synonymous terms, and as this oak was frequently used for sashes, doors, and furniture, it followed that these might be made of wall lining according to the phraseology of the day. The confusion that arises ultimately from this loose way of speaking of wood converted and unconverted may be appreciated if it is considered that had Dutch oak been used in the first instance for such work only, it would be quite as correct to say that of any room that it was wainscoted with Dutch sashes! A book on practical building written in 1850 says that "a Norway oak called Clapboard is frequently brought into London, and also one that is grown in Germany called Dutch Wainscot, being imported from Holland, to which country it is brought in floats down the Rhine." It is explained that both these woods have been extensively used here, and it is probable that the wainscot will still be employed for many purposes, for though it is softer and the grain more open than that of English oak, it is also less liable to warp. From this it appears that "Clapboard" was another name for Norway oak, and "Wainscot" came to signify oak grown in Germany. In both cases the purpose for which the woods were used came to displace the names of the woods themselves. In modern price books "wainscot" doors, sashes, floors, and staircases are described and priced, not a word being said as to what the material is, the writer apparently forgetting that wainscot is wall panelling, and nothing more. Indeed, in the index to one of these books the reader is startled by finding that wainscot is mahogany, the item being "wainscot mahogany in thicknesses." Crown oak "wainscot" logs, planks, plançons, and butts are now imported from Odessa, Libau, and Fiume, some of the qualities being described as prime, fresh, English crown wainscot logs, so that trade catalogues up to date speak of Odessa "Prime fresh oak wainscot" and "Prime fresh English crown oak wainscot," the terms varying so much that the smallest difference in the wording of a specification or invoice may lead to a lawsuit, which would settle nothing but the transference of the entire value of the wood in dispute to the pockets of the lawyers. Odessa oak wainscot logs sell for from 57s. 6d. to 60s. at *per 18ft. cube*, some logs going up to as much as 70s. The shape of these logs will be given in

another article. They have one rectangular face only—that where they are cut through the heart; two sides are tangential cuts, and the fourth side is irregular, with the bark and sapwood left on—This, however, seldom exceeds 1in. in thickness. As 18ft. cube of best Odessa crown wainscot oak costs 70s., it follows that as a little more than 180 super. feet of 1in. boards can be cut out of this standard quantity, 1in. wainscot boards would be worth not about 4½d.; these boards are seldom retailed at less than 10d., taking the boards as they rise from the log, for each log, when cut into boards, is stacked separately, leaving 5½d. per foot profit for handling and interest on capital. Odessa oak plançons are sold at from 85s. to 90s. per load, there being usually from 30ft. to 40ft. in a plançon; butts of from 12ft. to 24ft. are sold from 60s. to 70s. per load. Fiume round logs are worth from 57s. 6d. to 67s., the lengths being from 9½ft. to 35ft., and the contents varying from 50ft. to 150ft., the biggest round logs being, of course, the dearest. Good Riga oak logs are worth £5 per load in the round; they are from 14ft. to 23ft. long, and from 13in. to 18in. diameter. For some reason or other during the Gothic Revival, where church roofs, seats, or fittings were specified to be of oak, it was usually English oak; as Portland stone was more or less identified with Classic work, and Russian and German oak with the same styles, all these materials were passed over, and the woods and stones of Medieval times were as closely imitated as the forms and details of doors and windows. In fact, English architecture of the present day has so degenerated into a mere imitation of bygone styles that even a specialist in arranging the plates published weekly by the BUILDING NEWS is at a loss at first sight to say whether the buildings represented are old or modern ones. The "art" architects are the greatest offenders in this respect, though they consider themselves a consecrated class, as it were, and the salt of the earth, in whose presence it is indecent to speak of practical knowledge of any kind, and outrageous to refer to "5 per cent." Their works are always miracles of self-complacency, incompetency, and absurdity. They lecture and talk much about "art," and the man who talks the most has an immense advantage over the man who thinks the most. Many art architects write "B.A." or "M.A." after their names with a view to impress the public with the high standard of culture to which they have attained, forgetting apparently that a learned man may be utterly deficient in the saving grace of common sense, and therefore a crank who may develop into a bore when he takes to pen and ink, and is allowed unrestricted space in a public journal. However, one would be thankful if those gentlemen confined their art information to professional papers, and did not let the public have it in a more permanent form! During the Gothic Revival in this country, when our architects succeeded in attaining to the apotheosis of faddism, "Dutch wainscot" was rigidly tabooed in all "middle age" work new or restored. Latterly the milder working Austrian oak has been used for pulpits, screens, lecterns, and other fittings where there is much buttressing and crocketing and little sense. Austrian oak comes here cut like wainscot logs, and it sells at from about 2s. 4d. to 2s. 6d. per cube foot. "Figury" planks 3in. thick are worth 3s., and 1in. to 2in. about 2s. 4d. per cube foot. These may be from 11in. to 24in. wide. Though English woods have not been referred to in the preceding articles, this appears to be a fitting place for a notice of our own oak, which has almost disappeared from our buildings. At one time all the carpentry and joinery of churches and private houses were of oak—English oak only. War vessels, too, were built of it. One alone, a 70-gun ship, would require 3,000 loads, or as many good-sized trees as could be grown on fifty acres of land; but this is all changed—the only oak found on a modern building being that in the home-made stock of a bricklayer's level, or the extemporised mason's square. Should the architect specify English oak sills for the window-frames, the practical man assures him that a good (sappy) imported Baltic yellow sill will last longer, and the practical man generally comes out "on top." There are two leading varieties of oak in England, *Quercus sessiliflora* and *Quercus pedunculata*. In the first, known too as the Durmast oak, the acorns grow in clusters close to the shoot, and the leaves are set on short leaf-stalks, whilst in the other (or old English oak) the acorns grow simply on

stalks 1in. or 2in. long; and the leaves are close to the twig without the intervention of a long leafstalk. Of these two kinds of oak, the "leading line" for building is the last, for it is the strongest and most durable, as well as having the most heart-wood in proportion to sapwood. As chestnut is sometimes mistaken for oak, it may be well to note that there is much less sapwood in the former than in the latter; at the very outside, six rings of sapwood in a Spanish chestnut are nearly equivalent to 18 rings in a common oak. The timber merchant buys oak standing, and it takes a man of life-long experience to make even a tolerably safe guess as to the soundness of a growing tree. An old writer said, "There is not in Nature a thing more obnoxious to Deceit than the buying of Trees standing, upon the Reputation of their appearance to the Eye, unless the Chapman be extraordinarily judicious, so various are their hidden and concealed Infirmities till they be felled and sawn out; so as if to anything Applicable certainly there is nothing which does more perfectly comprise it than the most flourishing Outside of Trees, Fronti Nulla Fides. A Timber Tree is a Merchant-Adventurer. You shall never know what he is worth till he be Dead." Unfortunately, trees are not the only thing "obnoxious to deceit" by taking them on "the reputation of their appearance," and human beings are sometimes known to have a similar failing. The oak was a favourite tree with the Druids, and cutting mistletoe from its branches was made a religious ceremony with them. The Christians, too, have always valued it, for in the early days of the Church in this country true believers knew the cross was made of oak because it was so heavy! The Venerable Bede, who had a taste for cabinet making, asserts it was of Cypress, Cedar, Pine, and Boxwood, whilst other divines contended for Cedar, Palm, Cypress, and Olive. Not only the wood, but also the juices of the oak, were articles of trade, for "by diversity of Percolation and Straining, and by mixtures, as it were, of Divine Chymistry the juices of the oak are wonderfully specific in corroborating the Entrails, Reins, Liver, Back," and other parts of the body too numerous to mention. Modern science, which divides chemistry into organic and inorganic, wholly ignoring that which is Divine, has removed the juice of oak from the list of drugs given in the "Pharmacopoeia Londinensis," notwithstanding the sanctity of its origin! With the exception of teak, oak is the most durable wood used in building in England at present. But it must be handled by a man who knows something about it, for there is no more troublesome wood if it is not carefully selected for building work. It shrinks much, and never seasons apparently, even under cover, for oak felled 300 years and stacked in a dry place will shrink after the outer skin is removed by planing. If the tree from which any scantling has been cut grew with a twist in it, which may readily be seen in the bark or naked wood, the joinery framed up with it will wind, and if straightened will wind again, and continue to wind, for the wood is all cut across the grain. If, again, there are knots in the wood, they will, if large, sink into the face of a plank at one side, and stick up on the other side of the same surface. In fact, there is no wood so valuable for building as English oak when carefully selected, or any so utterly valueless when it is used indiscriminately as it comes from the saw. In purlins, principal rafters, and other main bearing timbers, all failures occur at knots, the pieces in course of time being broken right through, though the pieces were apparently sound, and stood up to their work for some four years after they were fixed. Knotty beams "sag" a little, the deflection increases, and finally they break across, leaving a cavity, owing to end grain shrinkage all round the knot. Oak timber defective in this way should not be used for carpentry. When knotty timber is used for joiner's work it seasons crooked, and if solid oak frames of cross-grained or knotty wood are made to take sashes of teak, mahogany, or any other straight-grained wood that will not twist in seasoning, then in course of time the frames will fail, for sills, heads, stiles, mullions, and transoms will all bend and twist so much that in some places the sashes may be drawn completely out of the frame rebates. After thirty years' use of English oak in building, the writer would not look at any knotty or twisted stuff except for firewood, and timber for joinery would only be used if cut from the trunk of a straight-grain tree from below the first branch, and this

decision has been arrived at from the use of both kinds of wood under his own personal superintendence. That oak shall be durable it is necessary that it should be felled at the right time. At Portsmouth in 1813 it was found that some war vessels built of oak were sound after ninety-five years' service, whilst in others the timbers were in a state of advanced decay after twelve years. The reasons for this were found to be solely due to the fact that in the first case the trees were felled in the winter, and seasoned for four years before being used. In the latter case the trees were felled after bark stripping—that is, in summer, and they were used in a green or unseasoned state. To hurry the seasoning of timber in the dockyards, the authorities tried charring, liming, brining, steaming, boiling, and snail-creeping; but these processes, one and all, proved utter failures. Oak timber should always be cut from a ripe or fully-grown tree—that is, one which shows a dead top. As long as the whole head looks green and vigorous, the tree is growing and the wood immature. When a dead top appears, the tree should be cut down at once, and the timber cut into fitches or planks of the size required. In the old days of wooden ships there was a great demand for compass timbers; they were also used in framing the principal rafters of barns and other farm buildings. This made the wood scarce and expensive. A genius of the time worked out a plan for making trees grow to any design required by chaining the growing stems to stakes driven into the ground. Another man, also much in advance of his time, elaborated a plan for making the trunks and branches of trees grow square instead of round, thus getting rid of waste. But neither was successful, and Providence saved the nation by putting it into men's minds to build their war-craft with steel instead of oak. We cannot help regretting that the square trunk was not a success, for then the trade would not have been plagued with Iloppus, his string measure and quarter-girth, or the 113 divisor! There are some curious statistics given about the size of oak trees. In old books on forestry there is a record of one which measured four yards in diameter, breast high, and had a trunk 40 yards long! Unfortunately for the reputation of this giant, it was discovered that a slight mistake had been made in noting the dimensions, for feet were written down as yards. One hundred feet may be taken as the outside height of a fully-grown oak tree in England. Scantlings cut from the centre of the heartwood of an oak are stronger than any cut nearer the sapwood. It is also true that scantlings cut near the sapwood are stronger than heartwood. As these statements are mutually destructive, how are they to be reconciled? The heart of an old tree always decays first at the pith, and in many such trees the heart has disappeared completely, leaving only a thin shell of heartwood to support the sapwood. Before the heartwood was thoroughly decomposed, it must have passed through every stage from soundness to rottenness. At first the heartwood was harder than any other part of the tree; then it gradually failed as decay progressed, until it was no longer the strongest part of the wood, but the weakest, the strong wood then being that immediately inside the sapwood. Heart of oak is therefore the strongest wood in a tree which has just attained its maturity after vigorous growth, as it is the weakest in an overgrown tree with rotten branches, for as these spring from the heart of the tree, so when they are neglected decay is carried into the trunk until the whole is destroyed. All pollard oaks are hollow-hearted trees;—the wood being used for ornamental purposes only, makes this failure a matter of no importance.

by improved machinery has been reduced considerably, and the most artistic hangings can now be obtained at very low prices. The illustrations include not only English, but French, American, and German designs. The author's hints on the selection of papers will be found valuable. Many mistakes are made by those who select wall-paper for rooms, in regard to the height and size, and the aspect and light, and the purpose of the room. Chapters I. and II. contain useful advice on the question of selection. A cheap paper well chosen, as the author says, is often more satisfactory than an expensive one which has been selected without due consideration of the position it is to occupy. Mr. Jennings remarks "the size, shape, and light of the room must be carefully considered in selecting a paper, the light being of the utmost importance. . . . In nine cases out of ten, perhaps, the tenant or owner of house will visit the showrooms of a wall-paper dealer and make a selection for the different rooms on the same principle as that which would be used in choosing the material for a dress. Because the design is pretty or suits the taste of the person who is making the selection, it is accepted, quite irrespective of whether it is suitable for the position it is to occupy or not." For this purpose the author recommends the plan of selecting two or three different patterns for each of the principal rooms, which are to be temporarily fastened by tacks upon the walls. A few rules are laid down. The author says the occupier's taste should be consulted in making the selection, as some people have an aversion to particular colours: on some yellowish-greens have had the effect of making their heads ache, and there are certain hues which are favoured. Certain principles must be observed in the height and length of room as compared with the breadth and aspect. A dining-room should be cheerful. If it faces the south, it would not be advisable to use the same paper as if it faced the north, because the amount of sun admitted would be very different. A very lofty room might be furnished with a very deep frieze, while a low room would require a paper having vertical stripes to give apparent height. A long and narrow room, he says, "should never be hung with a very set pattern, as the perspective will tend to increase the length. It would be better to divide the walls up into panels, although this to some extent accentuates the length." These and other considerations, like light, aspect, height, and other visual elements are most important, and are irrespective of the uses of the rooms. We may call them physical or physiological reasons, and a great deal may be said on them as based on certain laws of vision. For walls intended to have pictures, the wall-paper should be considered as a background—not a pattern or a scheme of pronounced colour; but how seldom this is observed! It is one of the common mistakes. Lately a more correct taste has been followed; perfectly plain backgrounds or "ingrains" have been used, which were used in the United States many years ago. Chosen in proper colourings, and with bold, brightly coloured friezes, the author recommends them. The bright friezes may, we think, be a mistake in some rooms. Of course the flatness and avoidance of gloss is desirable, also that the colour of the "ingrain" is a neutral, so as not to detract from the colouring of the pictures. These "ingrains" are printed on faint, simple stripes or patterns. The author, in fact, is right in thinking that for "many reasons a perfectly plain ingrain or ground paper, with a bold, well-designed frieze is the perfection of good decoration." Stencil effects, he thinks, come next to ingrains in a single colour where pictures are to be hung. Taste varies in different localities; thus in some districts in the West-end the selection of papers would be such that persons in the East-end would hardly look at. That the actual merit of a good paper design has nothing to do with the price, is a sound rule; many cheap papers have a good or better design than those costing three times as much. The author considers each room separately and the most suitable paper for it, and one or two good designs are illustrated, as the "Empire" treatment for dining-room or hall, by W. Campbell and Co. Marble paper, ruled in blocks and varnished, is no longer the taste. After plain paint, suitable designs with distinct patterns to relieve the large surfaces and "highly-coloured designs" are recommended; they give warmth and cheerfulness to the hall. Many bold and excellent

designs are illustrated—some in panels, as the "Wattrau." A bold frieze and dado of some height and varnished is used sometimes with a plain paper above. For drawing-rooms more delicacy of treatment is necessary, and the "Empire" styles of decoration are certainly suitable. The colouring should, of course, be in delicate shades, and a kind of "Wedgewood" treatment looks well. For old-fashioned heavy furniture the design should be in character, and a bolder treatment is necessary. The author says, "If the furniture is quite modern, it will not do to use a heavy floral design unless the colours are chosen to agree with the fabric used for covering the chairs, &c. A London manufacturer has for many years brought out chintz papers, which are much liked. These papers are copied also in fabrics, so that the fabric may be used on the furniture and exactly the same design on the walls." The author does not endorse this system, which certainly, as he says, may become monotonous. But no rule can be laid down—every room, its light, aspect, furniture and decorative accessories, carpets, drapery, must be carefully considered. For a dining-room comfort is desirable, and rich warm colours are recommended; if there are pictures a plain ground with a deep frieze is one of the best treatments. If there is a pattern it may be made subordinate to the pictures. "Stripes or a small dotted design" is said to look well with a bold frieze. But here, again, no general rule can be laid down, as the treatment to be adopted depends on the dimensions, the aspect and light, the kind of furniture, and if there are pictures. Oil paintings in heavy gilt frames suggest a quiet colour, but one not so delicate as if the wall were hung with small water-colour drawings or etchings. Bold patterns can be used with effect in large dining-rooms. Other suggestions are made for music-room, study, morning-room, bedrooms, boudoir, nursery, &c. The purposes of these rooms should suggest the treatment and colour: thus for bedrooms the paper ought to be quiet in pattern and colour. Anything like a design that is prominent, and appears as if it "would hit you" or too rigid in pattern must be avoided, and much the same caution is desirable in a study. Nor is a set pattern desirable in a bedroom for a sick person. Many very suitable designs are given, and several designs are shown for nursery friezes and panels of a playful and up-to-date character. Ceiling decoration or papering are also dealt with. We notice designs in stucco relief, and several examples of Lincrusta, Anaglypta, Tyne-castle canvas relief, and other wall decorations. English, American, and French wall-papers are dealt with in separate chapters; and the various kinds, such as "blanks" or "pulp," machine and hand painted, gold-bronze papers, "satins," "flocks," sanitary papers, "ingrains," silkettes, Japanese leather, Oriental tapestries, &c., are fully described. The tools employed in paper-hanging are described. Ceiling decoration, dados, fillings and friezes and drapery, pleated and lace decorations, form the subjects of other chapters of Mr. Jennings's useful and comprehensive handbook. The illustrations are very numerous, and exhibit the manufactures of well-known firms and the wall-hangings on the market.

CHURCH OF ST. JOHN BAPTIST, ADEL.

THE church at Adel is five miles from Leeds station, three miles from Arthington Junction (N.E.R.) and Kirkstall station (M.R.), and two miles from Horsforth station (N.E.R.). The key of the building near the church where the Roman remains are kept may be obtained at the rectory. Founded at some time between A.D. 1075 and A.D. 1130, and dedicated to St. John the Baptist, the church remains to this day a typical example of a small Norman church. There are indications in the shape of curious stones which have been discovered in the foundations of the former existence of a previous town church. The etymology of the name is not certain; but the earliest form of it, Adele, favours the attractive but pure conjecture that it was connected with the name of Adela, mother of King Stephen, and fourth daughter of William the Conqueror. Other forms of the name have been Adell, Addle, Athill, and Adle. That it was a place of some importance in earlier days is proved by the remains of a Roman settlement which were found here in the last century, and the still extant mound of a Roman camp, which may be seen on the left, near the road that leads north from the church, about 200 yards

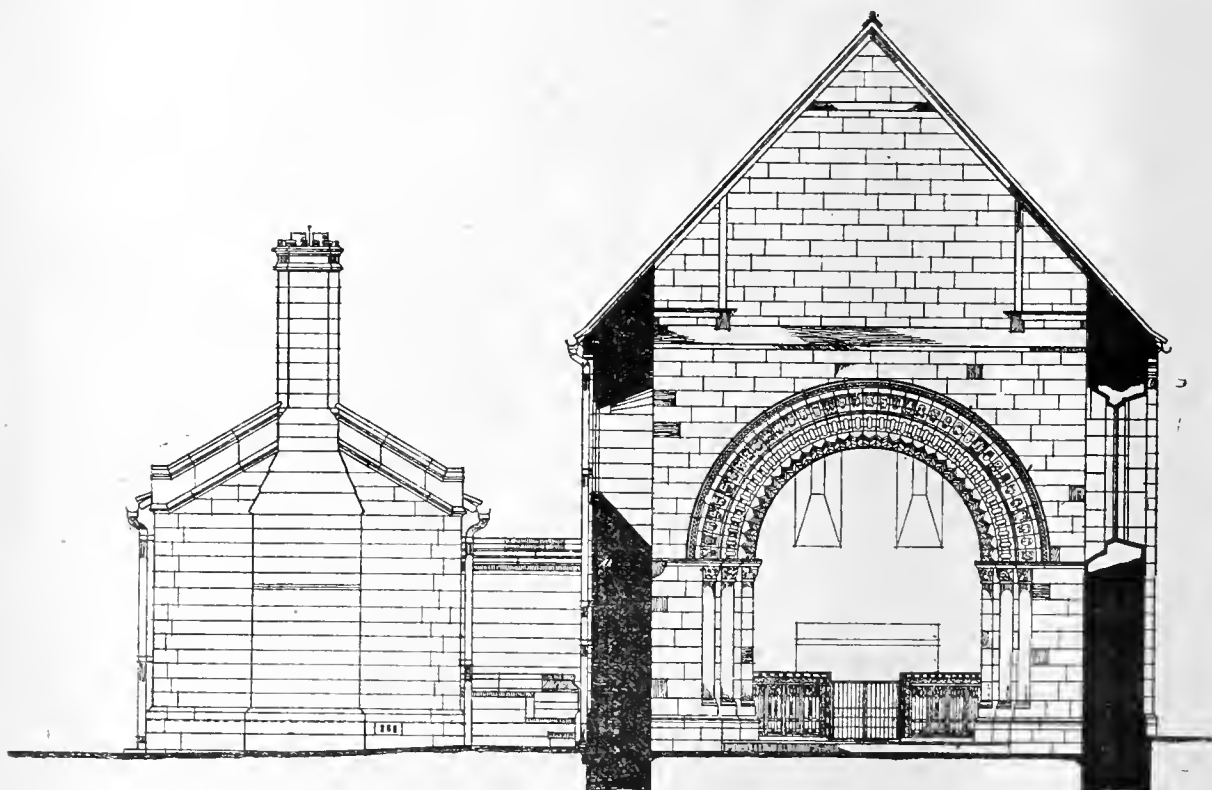
WALL-PAPERS AND WALL-COVERINGS.*

A PRACTICAL handbook on the above subject for decorators, paperhangers, architects, and others, by Arthur Seymour Jennings, Editor of *The Decorator*, &c., has just been published by the Trade Papers Publishing Co., Ltd. The author, in the well-reproduced illustrations and text of this volume, gives a good general idea of the progress made in the materials and methods of wall-hangings, and the manufacture of wall-papers. The cost of production

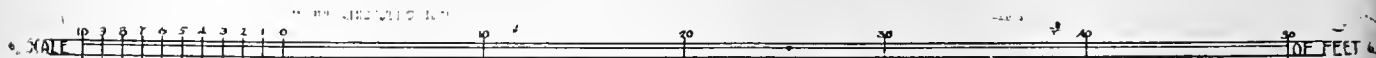
Wall Papers and Wall Coverings. By ARTHUR SEYMOUR JENNINGS, Editor of *The Decorator*, &c. London: The Trade Papers Publishing Co., Ltd., Birkbeck Bank Chambers, W.C.

CHURCH OF ST. JOHN BAPTIST,

ADEL.



TRANSVERSE SECTION.



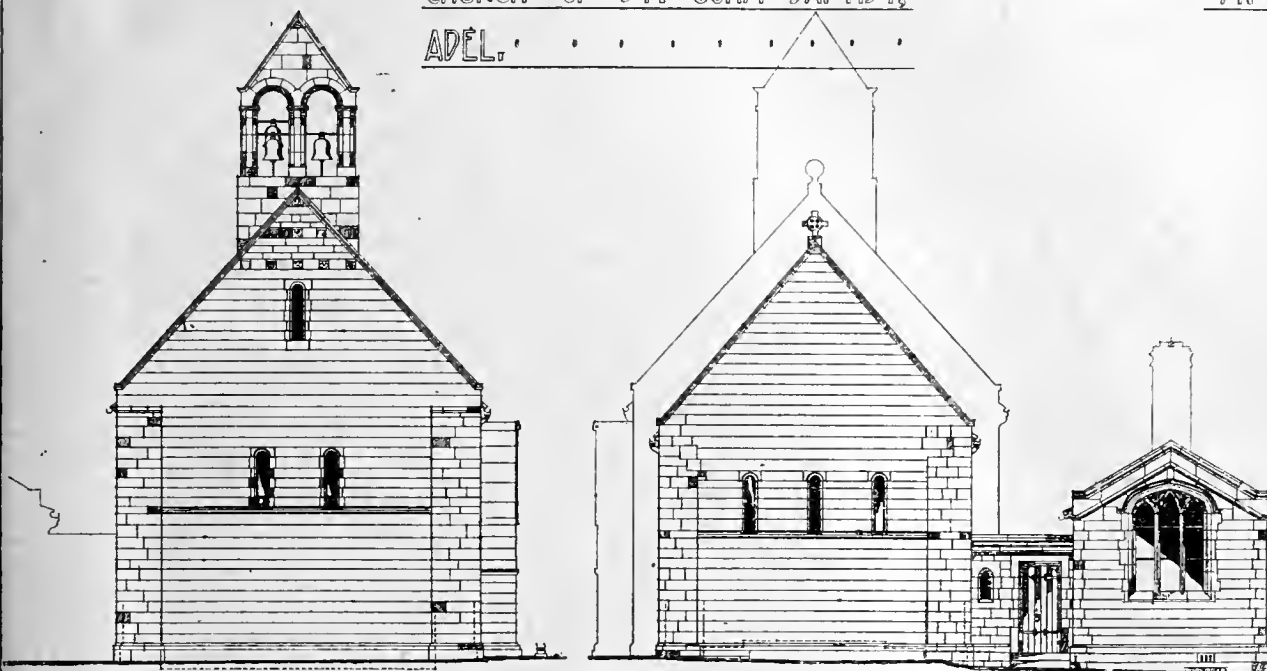
beyond the bridge which crosses the beck. It may have owed its importance to its natural position, and its proximity to one of the main cross roads from east to west, and it would appear that the site of the church was chosen to meet the needs of a population scattered over a much wider area than that of the present parish. It is not known by whom the church was founded. The length of the nave is about 47ft. 9in. by 21ft. 7in., and that of the chancel about 25ft. 1in. by 17ft. 8½in. in width inside. The style is of the Norman period at its richest. The south porch and chancel arch are exceedingly fine specimens of the art of this period. The sculptures over the archway of the porch are each on separate stones fitted into the irregular space formed by the gable and the outer line of the arch, and not carved upon the courses of masonry—a method usually adopted in later and modern work. There is a peculiar dragon's head at the apex of the gable, with eyes of inlaid work. On the door itself, which is not old, is a fine bronze handle, perhaps contemporary with the church, and used as a sanctuary handle, smaller than, but not unlike in style to, the one on the door of Durham Cathedral. The idea of it is that of some malignant power trying to swallow the head of a man, but not succeeding. Around the church under the eaves runs a corbel table of grotesquely carved heads, 75 in number, and also nine others on the upper part of the west wall. As seems to have so often happened in the 17th century, the roof of the building fell into decay by the removal of lead or some other cause, and the only repair that was done was to place a flat lead-

covered ceiling over the nave, which was done in the year 1686. The roof of the chancel was never lowered to the same extent; but the original Norman roof had become much decayed, and for several centuries it was not known that any of it remained. In the year 1843, however, the Rev. Geo. Lewthwaite, rector, in making an investigation for repairs, found that a considerable portion of the original timbers of the Norman roof had been left and used in the construction of the existing roof, in such a manner that it was possible, with skilled advice, to see what the form and structure of the original roof had been. He called in Mr. R. D. Chantrell, architect, who not long after was commissioned to restore the roof as near to its original design as possible, and using as many of the old oak beams as were sound, and this was accordingly done. The present bell gable was designed by the same architect in the year 1839, and took the place of a wooden one that fell down in the previous year, and which, with one bell in it, had stood behind the west wall and resting on oak cross-beams of an older period than the lead roof of 1683. The roof of the nave itself, as we see it, was put up in 1879 by the late Mr. G. E. Street, R.A.; the vestry was erected and new oak seating put in at the same time. There is no doubt that originally all the windows of the church were of the same design—namely, the narrow lights which were characteristic of the Norman style. The first change from these was the insertion of the window in the south side of the chancel between the priest's door (now screwed up) and the chancel-arch. This belongs to the

14th or early 15th century. Then, at a later date, the two large windows on the south side of the nave were put in, and a similar window, but larger still, was inserted in 1681 in the east wall, and filled with glass of the period, which may be seen in the vestry, to which the window was removed by Mr. Street. The two lower windows in the west wall were inserted in 1839 by Mr. Chantrell, and took the place of two modern ones that had been made to light a gallery. When the coatings of wash were removed from the walls in 1878, portions of the Holy Scriptures were found painted on the two earliest coatings in Elizabethan characters. Over the priest's door were the words: "Keep thy foot when thou goest into the House of God," and on the north wall of the nave were painted the Beatitudes and the Ten Commandments. In the vestry may be seen a painting of the interior of the church as it was from 1681 to the restoration of 1878-1879. We have nothing but conjecture to guide us as to the purpose of the stone bracket near the pulpit: it has every appearance of being contemporary with the church itself, and was probably a stand for a crucifix or image. From the "Survey of Church Lands for 1649," in Lambeth Palace Library, it will be found the church had a narrow escape from being pulled down; but it is not known what fortunate occurrence prevented this from being carried out. The Registers of this church begin in 1600, and have been printed by the Thoresby Society, from whose secretary copies are still obtainable. It only remains to add, note as to the stone coffins and other antiquities preserved in the building near the west gate

CHURCH OF 'ST: JOHN BAPTIST,
ADEL.

No. 4.



WEST ELEVATION.

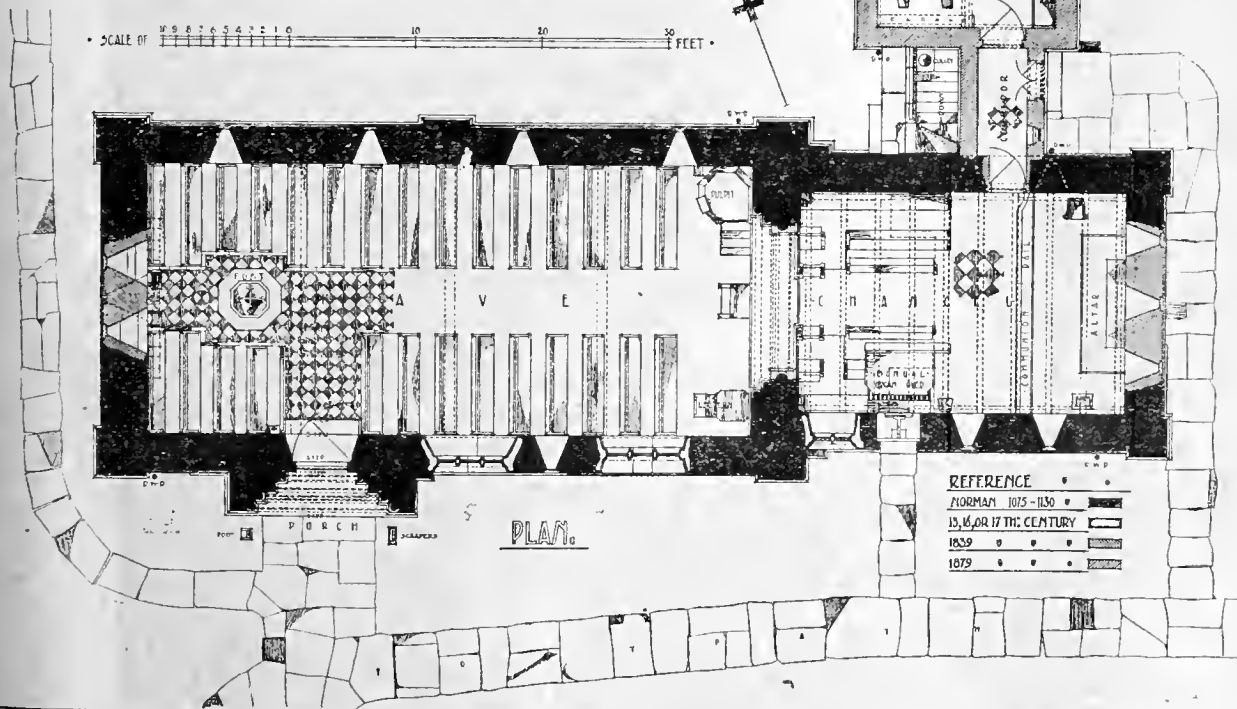
EAST ELEVATION.

• SCALE 1" = 10' 0" 10' 0" 20' 0" 30' 0" 40' 0" 50' 0" 60' 0" 70' 0" 80' 0" 90' 0" 100' 0" FEET •

CHURCH OF 'ST: JOHN BAPTIST,
ADEL.

No. 1.

• SCALE OF 1" = 10' 0" 10' 0" 20' 0" 30' 0" 40' 0" 50' 0" 60' 0" 70' 0" 80' 0" 90' 0" 100' 0" FEET •



REFERENCE
 NORMAN 1075-1130
 15, 16, OR 17 TH. CENTURY
 1839
 1879

PLAN.

the churchyard. The most interesting relics are three small Roman altars, on one of which are the words "Deae Brigant," which were found, were the coffins, in the fields across the beck the north of the church opposite the site of the

camp. There is also a large round stone, apparently the capital of a Roman pillar; and one very rudely carved, with a diamond pattern, and having the appearance of some decoration having been chipped from the centre. There is also a

stone with the rudely-carved words "Priminus Mutula."

These are a few of what was once a large number, most of which have unhappily been lost.

FRED WADE.

WHAT IS THE CHEAPEST PAINT?

By J. CRUICKSHANK SMITH, B.Sc., F.C.S.,
Member of the Society of Chemical Industry.
(Author of "The Manufacture of Paint.")

IN order that we may arrive at a correct appreciation of what will be in the long run the cheapest paint, four points have to be attended to:—

(1) *The Composition of the Paint.*—This strikes every person as being an important, if not the most important, point to be attended to. Unfortunately, however, there is vast difference of opinion as to what is under normal conditions the best protective coating for exterior iron or steel work. It has for long been the writer's opinion that the ultimate composition of the paint materials is not a matter with which the user need concern himself, provided he has placed himself in the hands of a scientifically-trained paint manufacturer for the supply of his protective materials. It is a little disconcerting, however, to have to place on record the fact that the number of paint manufacturers who have studied the question of corrosion, and the best means to be adopted for its prevention from a scientific and technical point of view, is almost as limited as the number of practical engineers who have an exact and technical acquaintance with the subject of paints. The outcome of this is that the paint-maker, being in many cases unable to advise in a rational manner as to the selection of materials for use under given conditions, the engineer is obliged to make the selection himself, with the result that he talks of white-lead paint or red-lead paint or zinc paint as if these terms always referred to materials of exactly the same composition, and possessing in every case identical physical and protective properties.

But let the paint manufacturer come to the engineer and say: "Here is a paint made of certain selected materials, which my experience and technical knowledge assure me are calculated to yield satisfactory results. Experiment has proved that this paint will, under ordinary conditions, protect an iron or steel surface more effectually and for a longer period than any other paint with which I am acquainted." Surely such a statement, made by a firm of repute, and whose *bona-fides* are beyond suspicion, ought to command attention. At any rate, such procedure would surely be preferable to the present chaotic state of matters, in which one manufacturer says, "Here is my genuine white-lead paint: this is the best and cheapest material you can use for protecting your bridges;" while a second manufacturer says, "Here is my genuine zinc-white paint, which every expert agrees is the only durable protection for your iron bridges;" and a third paint manufacturer says, "Here is my specially selected oxide of iron paint, which, as everyone knows, has not an equal for protecting your iron bridges:" and so on, *ad infinitum*.

The selection of the materials in the paint is undoubtedly a matter of the first consequence, but unless the engineer is prepared to make himself acquainted with the theory and practice of colour-making, paint grinding, oil boiling, and the methods adopted in blending these materials so as to produce the mixture known as paint, he is not in the best position to judge as to what are the most suitable constituents. By throwing on the manufacturer the onus of the selection of the materials used in the paint and of the thinning of the same before use, the engineer causes the latter to assume a considerable responsibility, but not a greater responsibility than the implied claim to be considered a technically qualified manufacturer warrants.

(2) *Prime Cost of the Paint.*—Too often this is regarded as the end-all and the be-all of the question. That it is not so can, I think, be very easily shown, and I have endeavoured to bring this point out in a graphic manner by means of tables. Indeed, one may go the length of saying that of all the factors that go to make up the ultimate economic value of a paint, that relating to its prime cost is the least important. This statement must not be interpreted as a contention that ridiculously fancy prices for protective paints are to be defended or are even necessary. What I want to bring out emphatically is that in nine cases out of ten far too much attention is paid to the prime cost of the materials and far too little to the other dominant factors.

(3) *Covering Capacity of the Paint.*—The term "covering capacity" is here used in the sense in which it has come to be employed as a scientific

term to express the area that can be coated with a given weight of paint. To value a paint, therefore, in terms of its economic value we must know the area covered by a given weight, or inversely, the weight of paint required per unit of area. It is well to have some definite figure that can always be employed as a unit in this connection, and a convenient unit is a hundred square feet. This figure should always be determined experimentally by the prospective buyer. There is sometimes undue exuberance in the figures quoted by paint manufacturers as representing the covering capacity of their products. The latter is a property that should be determined by the engineer himself, and the experiment should be carried out on a sufficiently large scale, and under sufficiently rigid supervision, to insure reliable results being tabulated.

We here assume that the paint is supplied by the manufacturer in the condition in which it is to be used. If this is not so the remarks made under (1) do not apply, because the indiscriminate use of oil and turpentine, especially turpentine, may practically ruin the protective qualities of a paint which but for such additions might have been eminently satisfactory. If one point more than another has to be hammered into the heads of persons concerned in the protection of iron-work, it is that the materials must not be thinned in the indiscriminate rule-of-thumb method that applies (and quite legitimately so) in ordinary house painting and decorating. From the figure representing the covering capacity per unit area can easily be deduced the cost of material per unit area for one, two, or three coats.

(4) *Durability of the Paint.*—This is a factor that is frequently lost sight of, or if not entirely neglected is considered as being of less importance than it really is. When considered only in relation to a comparatively short space of time, such as three or five years, the durability of paint is not such an important matter; but if we make the basis of our calculations 20 years, then the number of occasions during this space of time on which the paint has to be renewed exercises a very important influence on the ultimate economic value of the paint.

It may be well to point out a confusion in terms and ideas that sometimes occurs in connection with the term "durability of paint." We have to make a distinction between the durability of the surface of the paint and the preservative action of the paint on the metal beneath. The two things are by no means identical. It is a well-known fact that many paint films may present a comparatively perfect appearance from the outside while the metal beneath is corroded in a marked manner. This has been pointed out by many observers. Guber examined a large number of iron and steel bridges with the view of discovering the best means of preventing rust. In all cases rust was found below the paint (vide *Engineering*, 1895). Hence only very careful examination and scraping of the surface will determine whether after a certain lapse of time a paint is really durable in the sense of protecting the metal beneath it. It is herein, no doubt, that those who advocate oxide of iron paint as the preservative *par excellence* of ironwork have been led astray. Oxide of iron can be made into a paint which will preserve its continuity of surface and general appearance of durability from the outside for very considerable periods; but underneath the surface the corrosive action may be proceeding rapidly.

These, then, are the four essential points that have to be known and allowed for before a reliable opinion can be expressed as to what is the cheapest paint. The following table which I have compiled from data which may be regarded as fairly reliable indicates how an engineer can figure out for himself what is the comparative economic value on a 20 years' basis of various anti-corrosive paints that may be brought under his notice. The cost of labour of application is not included; obviously the charge on this account will increase rapidly the greater the number of renewals that may be necessary.

TABLE OF RELATIVE COST OF VARIOUS PAINTS, ON A TWENTY YEARS BASIS.

Covering Capacity.—Calculated from the figures given by Mr. G. H. Hurst that 10lb. of the following paints cover on metal—

White lead	648sq. ft.
Zinc white	1,138sq. ft.
Red lead	477sq. ft.
Red oxide	870sq. ft.

Durability.—The relative figures are those

currently accepted by British and American engineers.

Cost.—This is estimated at what is probably a maximum figure for the very best materials in large quantities.

The paints here mentioned are understood to be supplied ready for the brush, and to be made with special reference to the purpose for which they are to be used.

	White Lead.	Zinc White.	Red Lead.	Red Oxide.
Covering capacity in square yards per cwt.	836	1,411	504	1,039
Price per cwt. in shillings ..	32s.	36s.	32s.	29s.
Cost (in shillings) per 100 square feet	44	28	60	28
Times painted in 20 years ..	5	5	3	7
Cost in shillings per 100 square feet for 20 years ..	2.20	1.40	1.80	1.96
Relative economic value on 20 years basis, the highest value being represented by 100	64	100	77	71

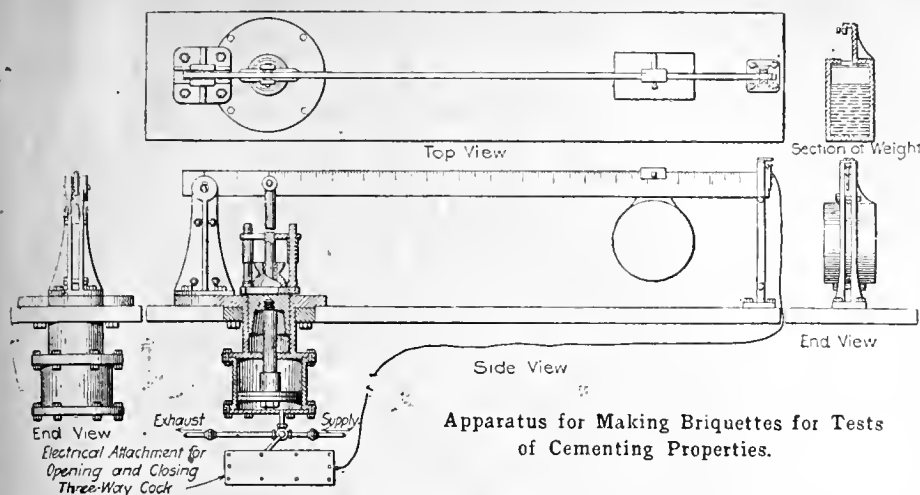
Let us suppose that in the above table the figure under zinc white representing the number of renewals necessary in twenty years be written 7 instead of 5, then the cost per 100sq.ft. for twenty years will be 1.96 in place of 1.40, and the economic value of zinc paint will be brought down under that of red lead, and equal to that of red oxide; yet between the prime cost of materials in the case of red oxide and zinc white there is, on our assumed price, a difference of 8s. per cwt. This shows the fallacy of laying undue stress on the cost of the paint.

One other point suggests itself in connection with the comparison with the economic value of paints, and that is, how is it possible in practice to wait for, say, 20 years before an estimate can be formed as to the comparative merits of different projective materials? Of course an opinion has to be formed after a comparatively short interval, say three or six months; but the trained eye of a person who has intelligently studied the subject practically can in the great majority of cases detect signs of wear and tear long before the paint has actually perished. In such matters it is, after all, not the skilful engineer or the erudite chemist who makes a bee-line for truth, but the man with observant eye and logical mind. As Huxley has said, "Science is, I believe, nothing but trained and organised common sense."

ROAD MATERIAL TESTS.*

IT is only of comparatively late years that the tests of materials of construction have been carried on in a systematic way, and the history of the tests of road materials is of still more recent date. Doubtless the ancient Roman engineer satisfied himself of the suitability of his materials to the end in view, but this was probably done in a very general way, or some records would have come down to us of the methods employed. Many of the earlier writers on macadam road building noted the superiority of wear in certain varieties of rock, and reference is often made to the desirability of hard and tough rock. As early as the middle of the 19th century compression tests were made on rocks in the endeavour to determine their road building quality. The systematic testing of road materials may be said, however, to have first started in France during the seventies, where it has been steadily developed ever since. The Portuguese Government was the next to take up the subject, adopted some of the French tests, and conducted them with much precision. While the importance of the subject has been recognised in England, yet, aside from the limited investigations of a few individuals, almost nothing has been done. The same is even to a greater extent true of Germany, and the other Continental nations have left the subject practically untouched. The United States is the only other country where this work has been carried on in a systematic way. In 1893 the Massachusetts Highway Commission, in collaboration with the Lawrence Scientific School of Harvard University established a road material laboratory at the latter institution. Although the testing of paving brick was begun previous to this date, this was the first laboratory in the United States for testing road materials. The Deval abrasion test was adopted, and tests for determining the cementin power of rock dust were first developed there. Since then laboratories have been equipped with appliances for testing road materials at Maryland

* A paper read before the American Society for Testing Materials, by LOGAN WALLER PAGE and ALBERT S. CUSHMAN.

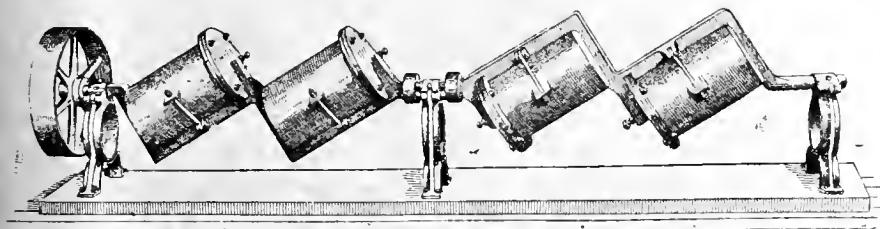


Geological Survey, Columbia University, Wisconsin Geological Survey, Cornell University, the University of California, and the Road Material Laboratory of the Department of Agriculture.

TEST OF ROAD MATERIALS IN FRANCE.

In December, 1878, the French commission on national roads decided to introduce certain mechanical tests at the laboratory of the school of roads and bridges, to be conducted in addition to and parallel with the road tests. A test, known by the name of its designer as the "Deval" test, for determining the resistance offered by road materials to abrasion, had already been found to be reliable by the street department of the City of Paris in testing the rock used in contract work, and for selecting new quarries. This test, having proved satisfactory, was accordingly adopted by

and quality. We will understand hardness, therefore, to be the resistance which a material offers to the displacement of its particles by friction. The measure of hardness will be inversely as the loss of weight arising from the scoring by an abrasive agent. Toughness is understood to mean the power possessed by a material to resist fracture under impact. As the surface of a road is continually subjected to the pounding of traffic, it can be seen that toughness is an important property from the standpoint of the road builder. With heterogeneous materials like most of the rocks used in road building, toughness depends on a number of factors. Among these may be mentioned the interlocking crystals, the nature of the crystals themselves, and, in some cases, the nature of the cementing or binding agent. The binding power, or, as it has now come to



Apparatus for Abrasion Tests.

the commission and a laboratory was founded which has steadily increased in usefulness. Before proceeding with an account of the methods of testing at present in use in this country, it will be necessary to consider the three chief qualities essential to good road materials. These are hardness, toughness, and cementing or binding power. Although these properties have been long recognised (at least, hardness and toughness) by those familiar with the subject, yet they have never been properly defined, and the terms have been very much confused. This is not at all surprising, for hardness and toughness are closely related. It would be well, therefore, to define these materials from the roadmaker's standpoint before going further.

DEFINITIONS.

There is no widely accepted measure of the property of hardness. Even in the case of metals the hardness of which has received much study, there are many tests based on different conceptions of the term; but all of these tests were designed for substances of a homogeneous nature, and are consequently not at all suited for any of the road materials. Further than this, it can be seen that in their conception of hardness some of the investigators differ much. All of these methods, as well as modifications of them, may be put under two heads: Abrasion and Penetration. Different demands of technology give rise to different definitions and methods of test, and the method used in any particular case must have a measure of the value of a new material for the purpose to which it intended. Only one test has yet been devised for determining the hardness of road materials. This is the Dorrey test of the French School of Roads and Bridges, and consists in grinding specimens with sand of a standard size

be called, the cementing value of a road material, is the property possessed by rock dust or other finely-divided material found in nature to act as a cement on the coarser fragments composing crushed stone or gravel roads. This property varies, not only with different kinds of rocks, but also with those which are practically identical in classification and chemical composition. The absence of cementing value is so pronounced with some varieties of rock that they can never be made to compact with the road roller or under traffic. As the binder surface of a macadam or gravel road is most exposed to the action of wind and rain, as well as the wear and tear of traffic, it can be seen that the presence of this property is most essential to good results. The impervious shell obtained by the use of a rock of high cementing value gives the greatest protection to the foundation of a road. It is a matter of common observation that a good surface which binds well is less dusty and less muddy, while the economy is great, as it is only the loose, unbound material which is ordinarily carried away by wind and water. In view, therefore, of the importance of this property, it has been made the subject of especial study. It was important to know the cause of the cementing value with a view to learning if anything could be done to modify the conditions of service. From an investigation carried on in the laboratory (see paper by A. S. Cashman, *Journ. Am. Chem. Soc.*, May, 1903) it appears that this property is undoubtedly related to that of plasticity in clays, and, in a few words, is due to amorphous colloidal particles which, by reason of their characteristic porous structure, are able to absorb water, thereupon assuming a plastic and coherent condition. Heating above a certain temperature destroys this structure, and the powder no longer possesses

the slightest cementing value. It is hoped that this theoretical investigation will lead to important practical developments.

THE ROAD MATERIAL LABORATORY.

The Road Material Laboratory was established in December, 1900, in the U. S. Department of Agriculture. Up to the present time about 450 samples have been reported on, representing a geographical distribution over thirty-eight States of the Union, including a number of samples from Cuba. The aim of this laboratory is to carry out standard tests on road materials, free of charge, for any citizen of the United States. In addition to this, allied problems may be presented for study, such as the suitability of clay for the manufacture of paving brick, drain tile, cement, &c., the testing of cements and concretes for road foundations, drains, gutters, and highway bridges. It is the intention of the department to aid as far as possible in the solution of all the problems of road building, but more particularly with reference to rural highways. It is not, however, the policy of the department to undertake scientific investigations or tests of materials for manufacturers or others who desire to use the information thus acquired to promote commercial ends. The tests as at present carried on are as follows:—

ABRASION TEST.

A modified form of the Deval machine, as adopted by the French School of Roads and Bridges, is used for this test. It consists essentially of four cast-iron cylinders, into which samples of the rock broken to a size between three and six centimetres are put. Five kilograms are taken for the test. The iron cylinders are fastened to a shaft, so that the axis of each cylinder is at an angle of 30° with the axis of rotation. The shaft which holds the cylinders is supported on bearings, and has at one end a pulley-wheel, by which the cylinders are revolved, and at the other end a revolution counter. In the test the cylinders revolve at the rate of 2,000 revolutions per hour for five hours. The fragments of stone are thrown from one end of the cylinder to the other twice in each revolution. They thus grind and pound against one another, and against the ends of the cylinder. At the end of 10,000 revolutions the contents of the cylinder are removed and placed on a $\frac{1}{16}$ in. mesh sieve. The sieve and the fragments of rock remaining on it is then held under running water till all adhering dust is washed off. After the fragments have been dried they are weighed, and their weight subtracted from the original five kilograms taken. The difference obtained is the weight of detritus under $\frac{1}{16}$ in. worn off in the test. In the French School a standard rock of superior wearing quality was always placed in one of the cylinders as a standard of comparison, and the proportion of the weight of the dust under 0.16 centimetre of the standard rock and the rock to be tested was assumed to give the relative resistance to abrasion of the two. It was found, however, that only the best varieties of rock gave less than 100 grains of powder under 0.16 centimetre—i.e., 20 grammes per kilogramme, or 2 per cent. of their weight. The number 20 was, therefore, adopted as a standard of excellence, and the "coefficient of wear" for any rock tested was obtained by the following formula:—Coefficient = $20 \times 20 \div W = 400 \div W$, where W is the weight in grammes per kilogramme of detritus under 0.16 centimetre. This French coefficient has been in use for many years, and is familiar to road builders; so it is still determined in this laboratory, although many rocks have been found that give a result higher than 20, which is the maximum of the French standard of excellence. Besides the French coefficient, the percentage of material under 0.16 centimetre in size is always given.

CEMENTATION TEST.

The binding or cementing power of rock dust is such an important element in road building that much time has been spent in the endeavour to devise a suitable test for determining it. Many have been tried, but as yet only an impact test, carried on in a uniform manner as described below, has given satisfactory results. One kilogramme of the rock to be tested is broken sufficiently small to pass 6 millimetres, but to be rejected by a 1-millimetre mesh screen. It is then placed in a ball-mill and allowed to grind for two hours and a half. This ball-mill contains two chilled iron balls, which weigh 25 lb. each, and is revolved at the rate of 2,000 revolutions per hour. It was found by experiment that

two hours and a half of grinding, on rock thus prepared, was sufficient to reduce it to a powder that would pass through a 0.25-millimetre mesh. The dust thus obtained is mixed with water to about the consistency of a stiff "dough," and is kept in a closed jar for twenty-four hours. About 25 grammes of this "dough" is then placed in a cylindrical metal die, 25 millimetres in diameter. A closely-fitting plug, supported by guide-ropes, is inserted over the material, which is then subjected to a pressure of 100 kilogrammes per square centimetre. It is most important in making these briquettes that they should be compressed in a uniform manner, and for this a special machine has been designed. The height of the briquette should be 25 millimetres. If the first briquette is not the right height, the requisite amount of material is added or subtracted to make the height of the next briquette the required 25 millimetres.

(To be continued.)

PIPE SUBWAYS.

THE reconstruction of many of our thoroughfares and the commencement of new streets ought to be the right opportunity for laying down subways of brick or concrete of an approved form. Expense should not be spared in discovering the most efficient system; for a portion of Broadway, New York, a plan of pipe subways was suggested, and we believe is about to be carried out. A plan was prepared for the construction of pipe galleries in connection with the Rapid Transit Railroad. Dr. James C. Bayley, the consulting engineer, has worked out a scheme. There will be a large subway under the street surface on either side of the tracks of the double-track conduit electric railway running down Broadway. These subways will be for gas and water-pipes and similar conduits. Outside these and running to the curb on either side is a double-deck wire gallery. The upper ducts of this gallery are for the signal and other low-tension wires, while the lower ones are for lighting and power conductors, the two portions of gallery being separated by a passageway running parallel with the sidewalk. There are to be no manholes in the street. Access to the subways and galleries will be through manholes in the sidewalks, or through doors from the vaults of buildings into the passageway. The subways are to be built of concrete, with steelwork in the roof, which carries the pavement of street. This description, which we gather from the *Engineering Record*, ought to lead the municipal authorities of other great towns, notably London, to consider the subject of double-deck wire galleries and pipe subways for our main streets. The cost and delay to traffic caused by the tinkering system in vogue of cutting through the street paving for rails for tramways, flooding out leaky gas and water pipes, and the continual obstruction to footway traffic caused by removing the paving stones or asphalt to get at the conduits and wires on the foot pavements, are matters which call for immediate attention.

The additions to the Wallacetown Schools, Ayr, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Alfred Worth, aged 50, a foreman builder, living in Corporation-street, Falsworth, died on Saturday from injuries received in the course of the heavy thunderstorm which took place on Friday afternoon. Worth and three other men who were working upon a building in Ashton-road West, Falsworth, were struck by lightning, and two of them were killed on the spot.

The Board of Trade inspection of the Devonport Corporation's extension of the Devonport and District Tramways took place on Saturday. The inspectors were Colonel von Donop, Board of Trade Permanent Ways Inspector, and Mr. J. P. Trotter, Electrical Inspector of the Board of Trade. The routes inspected were those from Stoke-terrace to Ford Hill terminus, via St. Lavan's-road, and from Stoke-terrace to Camel's Head, where the party walked across a new bridge in course of construction, and resumed the journey in another car to St. Budeaux Station, from whence the lines are being extended to Saltash Passage. The work has been carried out from plans by Mr. J. W. Endean, general manager and engineer. Messrs. Griffiths, of London, were the contractors for the permanent way, and Messrs. R. W. Blackwell and Co., London, the contractors for the overhead equipment. Mr. J. C. Stretton was the clerk of works.

OBITUARY.

WE regret to announce the death of Mr. JAMES HENRY COOK, architect, of Liverpool, who, at the early age of 41, has passed away at his residence, Mostyn-avenue, West Kirby. The deceased gentleman was in indifferent health towards the close of last year, and he spent six months in Switzerland. But about a fortnight ago alarming symptoms again developed, and he was confined to his bed until the end. Mr. J. H. Cook had had an interesting career, which has closed at a highly promising stage. He was born in Liverpool, being the son of Mr. (now Alderman) Thomas Cook, F.R.I.B.A., architect and valuer, of Liverpool and Birkenhead. Having been educated at Liverpool College, in Shaw-street, he was articled to the late Colonel Walker, architect, and on the completion of his indentures he became associated with his father, in whose business he assisted for many years, and in 1887 he was awarded the silver medal for measured drawings from the Royal Institute of British Architects. Some twelve years ago he crossed to America, and during his eight years' stay in that country he acquired much knowledge that stood him in good stead afterwards. While in America he assisted some of the most prominent architects in New York and Philadelphia. Perhaps the most important work with which he was connected was that of the memorable World's Fair at Chicago, in which he aided the late Mr. Richard Morris Hunt. In Philadelphia he was also associated in several undertakings with Mr. Frank Miles Day. About four years back he returned to England and became connected with the business carried on by his father at 12, St. George's-crescent, Liverpool, the alderman retiring from the architectural department altogether and leaving that entirely under the control of his son, while he devoted all his energies to the valuing work. During the last few years Mr. Cook obtained the third premium in the recent Dock Board contest for the new offices which are to be built upon a portion of the old George's Dock site; while again the design he prepared was highly commended in the recent Liverpool Cathedral competition. Five of the competitors in the latter contest were selected to compete and eight others were highly commended, Mr. Cook being one of the latter, and the only Liverpool man to be so honoured. We published his design in our issue of Nov. 23, 1902. Among his works at Birkenhead are additions to the Oxtown-road Congregational Church, and large contracts he carried out for Messrs. Buchanan in extensions to their mills on the Dock estate and the construction of a grain silo. He also designed a house for Mr. Thomas Gilton in Budworth-road, while his practice in Liverpool extended to Seaford, where, two years ago, a Congregational church built to his design was completed. Other recent works were warehouses for Messrs. McCombish and Co., and for Messrs. Robinson and Co., a lecture-hall at Chadwick Mount Church, and additions and alterations to the Jewish Baths, all in Liverpool; and additions to Rake-lane, Wallasey. As recently as June 1 last he formed a partnership with Mr. Otis D. Black. He leaves a widow and three children.

BURSLAM has lost the services of a prominent public man by the death of Mr. JAMES BOWDEN, which took place on Sunday night at his residence, Oak House, Endon. The deceased, who was 65 years of age, was a native of the town. He established a successful business as a builder, from which he retired about ten years ago. He, however, maintained his interest in the building trade, holding the office of secretary to the North Staffordshire Master Builders' Association up to the time of his death. He was a member of the Burslem School Board for many years, and represented the borough on the Wolstanton and Burslem Board of Guardians. He was first elected a member of the town council in 1889, and was elected to the office of Mayor in November, 1900, his mayoralty being marked by the successful termination of the movement for the establishment of a commission of the peace for the borough.

A new clock, from the designs of Lord Grimthorpe, was formally set going at Sattrington parish church, Yorks, by the Right Hon. Lady Middleton, on Tuesday last. It has been made by Messrs. Wm. Potts and Sons, clock manufacturers, Guildford-street, Leeds, and Newcastle-on-Tyne, who are also erecting a new illuminated quarter chime clock at the parish church, Stanwix, near Carlisle, from the design and plans of Lord Grimthorpe.

PROFESSIONAL AND TRADE SOCIETIES.

CAMBRIAN ARCHAEOLOGICAL ASSOCIATION.—The annual meeting of the Cambrian Archaeological Association, which was opened at Portmadoc on Monday, under the presidency of Lord Glanusk. The local secretaries are Mr. C. E. Breece and Mr. T. E. Morris, the Lord Lieutenant of Carnarvonshire (Mr. J. E. Greaves) being the chairman of the committee, and Mr. R. H. Wood, Pantglas, Trawsfynydd, the president-elect. During the week visits have been made to the old church at Penmorfa and the house associated with Owain Glyndwr at Clenny, the ancient mansion of Sir John Owen, Dolbenmaen, Llanystumdwy Church, Crickieth Castle and Church, Ystumlyn, the historic home of Howel Ap Rhys; Harlech Castle, Llanfair, Llanbedr and Llandanwg, Llanarmon, Llanybi, Llanallhaiarn, and Beddgelert churches. The readers of papers have included Principal Rhys, Professor J. E. Lloyd, Mr. W. George, the Rev. J. Jenkins, the Lord Lieutenant of Merionethshire (Mr. W. R. M. Wynne), Dr. Walter Williams, Professor Anwyl, Mr. Romilly Allen, Mr. T. E. Morris, and the Ven. Archdeacon T. Williams.

CHIPS.

A Local Government Board inquiry was held on Tuesday at Croydon into the application of the town council to borrow the sum of £2,549 for extension of water-mains in various roads, £1,850 for works of surface-water drainage in various roads, £750 for new surface-water culverts at Norbury, £1,150 for sewer in Brewery-yard adjoining the water-works, Surrey-street, and £725 for works of sewerage, Woodside.

The city council of Liverpool are about to commence the transformation of St. Mary's Cemetery, Walton-road, Kirkdale, into an ornamental ground. Monuments unclaimed will, of course, be lowered and covered with soil. This represents an improvement of much moment to a densely-crowded neighbourhood. Liverpool now possesses forty-five public parks and gardens, with an aggregate area of 834 acres.

The new market hall for Leeds, which has cost £100,000, and occupies the central site between Kirkgate, Vicar-lane, and Ludgate-hill, is approaching completion. Messrs. Leeming and Leeming, of Westminster, are the architects, and Mr. J. Reid is the clerk of works.

The Frome Urban District Council have appointed Mr. F. W. Jones, the assistant surveyor, to the post of surveyor and inspector of nuisances, in the place of Mr. Philip Elinger, who has retired after thirty years' service.

The King, on the occasion of his visit to Ireland, has appointed Mr. Henry Williams, Secretary to the Board of Public Works, Ireland, to be a member of the Fifth Class of the Royal Victorian Order.

The borough engineer for Halifax has been instructed by the town council to proceed with the extension of the tramways from Hove Edge to the George Hotel at Brighouse, at an estimated cost of £10,378.

The private Bills passed during the last session include 218 private Bills, seven Electric Lighting Order Bills (confirming Board of Trade orders in respect of 52 districts), and two Tramway Confirmation Order Bills (confirming Board of Trade orders in respect of tramways).

A memorial stained-glass window has been erected at Lichfield Cathedral in memory of the Staffordshire Yeoman and Volunteers who fell in South Africa. It was executed by Messrs. Burlison and Grylls, of London.

Extensive additions have just been completed at Blairs College, near Aberdeen, from plans by Mr. R. G. Wilson, of Aberdeen. The additions, which have cost £33,000, and are executed in granite, completes three sides of a quadrangle, with, on the north front, a lofty square tower, furnished with a central crown dome and four angle turrets. The contractor was Mr. James King, of Aberdeen.

Mr. Percy E. Nobbs, A.R.I.B.A., of Trafalgar-square, Chelsea, has been appointed to the McDonald Chair of Architecture at McGill University, Montreal, in succession to Mr. S. Henbest Capper, M.A., A.R.I.B.A., who is returning to England to act as Director of the School of Architecture at Manchester.

The fire preventive qualities of the "Fawcett" fireproof floor were again amply demonstrated in a fire which occurred at the folding-box factory of Messrs. Cropper and Co., Southwark Bridge-road, on the 12th inst. In a letter to Messrs. Mark Fawcett and Co., Mr. H. J. Cropper states that a very considerable fire raged on the ground floor, but was kept from spreading by the Fawcett floor and ceiling.

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ILLUSTRATIONS.

RUTLAND COURT, KNIGHTSBRIDGE.—NATIONAL PRIZE DRAWING: CHRIST CHURCH PRIORY, HANTS.—RAILWAY HOTEL, LYME REGIS.—NEW HIGHER-GRADE ELEMENTARY SCHOOL, FINCHLEY.—DESIGNS FOR LIVERPOOL CATHEDRAL.—ST. JOHN'S CHURCH, ADEL, NEAR LEEDS.

Our Illustrations.

RUTLAND COURT, RUTLAND GATE, S.W.

There are four blocks of flats, two facing the High-road, Knightsbridge, and directly overlooking Hyde Park, and two fronting Rutland-gardens. They occupy the site of Stratheden House, and of the surrounding grounds. The house was at one time the residence of Lord Campbell, who therein wrote his "Lives of the Chancellors." The elevation has been carried out in red brick and Portland stone, the floors are fireproof, and, where the floors are 60ft. above pavement level, supplementary staircases have been provided. Each block has an electric lift, and is electrically lighted. The plans of the different floors vary considerably: the bulk of the flats are self-contained; but some are in the form of maisonnettes. The site was largely dominated by ancient lights, which have been successfully negotiated by the architect. Block 1 consists of basement, ground, first, second, third, fourth, fifth, sixth, and seventh floors. Block 2 consists of basement, ground, first, second, and third floors. Blocks 3 and 4 contain basement, ground, first, second, third, fourth, and fifth floors. The buildings have been carried out by Mr. H. Lovatt, at a cost of about £12,000, from the designs of and under the superintendence of Mr. Delissa Joseph, F.R.I.B.A.

VIEW FROM THE TRIFORIUM, CHRIST CHURCH, HANTS.

The triforium of this famous priory church is particularly interesting, and over the groining there are still remains of colour decoration in fresco of Mediaeval date. The view given by Mr. Harry Whitcomb's water-colour sketch, which we reproduce to-day, shows one bay of the Norman arcade, and looking into the church Perpendicular additions can be seen in contrast. We gave some measured drawings of Christ Church Priory by Mr. Percy Stone and Mr. Chas. J. Irwin in the Building News for Oct. 29, 1886. A view of the building from the north was published in our pages for Dec. 8, 1893, and details of the north porch will be found in the number of our journal for Dec. 16, 1887.

RAILWAY HOTEL, LYME REGIS.

This hotel is to be built with Pinhoe bricks and Ham Hill stone dressings on the ground floor, the upper story being in cement finish with a coarse surface. The roof will be covered with hand-made tiles. Mr. Arthur W. Yeoman, of Chard, is the architect.

FINCHLEY HIGHER ELEMENTARY SCHOOL.

This school is in course of erection on an admirable site on the Great North-road, between East Finchley and Whetstone, and will provide

accommodation for 330 scholars. The general scheme of plan shows ten classrooms grouped round a large central hall, with separate main and playground entrances for boys and girls at each end of the school. Two stairs, one at either end, are external to the main buildings, and give access to science and art classrooms, which are placed on the first floor. Special provision has been made for the lighting and ventilating of these classrooms. The buildings will be of brick, faced with red sand-faced bricks; the dressings will be of Monks Park stone, and the roof slated with Westmoreland green slates. The whole of the floors will be fire-resisting. The architect is Mr. W. G. Wilson, A.R.I.B.A., of Bloomsbury Mansions, Hart-street, W.C., whose design was selected by the Finchley School Board, it having been placed first by Mr. T. Colcutt, F.R.I.B.A., the assessor.

LIVERPOOL CATHEDRAL.

This double-page illustration gives a transverse section through the nave, showing lantern, transepts, and transeptal towers. It formed part of the series of drawings submitted by Messrs. Austin and Paley.

CHURCH OF ST. JOHN BAPTIST, ADEL.

(For description and further sketches, see pages 233, 234.)

CHIPS.

Colonel R. E. Slacke, an inspector of the Local Government Board, has held an inquiry at New Mills into the application of the urban district council for sanction to borrow £3,000 for the enlargement of the gasworks.

The Hon. Dudley Gordon, the second son of the Earl and Countess of Aberdeen, is fitting himself for life's battles by working as a joiner for an Aberdeen firm.

The British Ambassador in Berlin, Sir Frank Lascelles, acting on behalf of the King, unveiled, on Saturday, a memorial to the late Empress Frederick in the English Church at Homburg. It takes the form of representations of the four Evangelists in high relief above the pillars of the middle aisle, which have been executed by Mr. W. Ohly as a labour of love.

The Finance Committee of Aberdeen Town Council have found, on opening the tenders for the reconstruction of the interior of the Town House, that they considerably exceed the estimate of £10,000. Further consideration of the subject was deferred.

Major Druitt, of the Board of Trade, has inspected the further extensions of the Doncaster electric tramways, the chief being a line from Station-road to Beckett-road, Wheatley, and the other a loop line from Station-road to High-street.

Mr. George Prewett, for the last thirty years foreman of the joinery department at Southampton Docks, died on Thursday in last week, aged 71 years.

The Ipswich Corporation at their last meeting adopted the recommendation of their Electric Supply and Tramways Committee that Mr. Frank Ayton—who had been engaged since October last as resident engineer, representing Messrs. Kennedy and Jenkin—be appointed as engineer and manager of the electric light and power station and tramways undertaking, at a salary of £401 per annum, with an understanding that his salary would be increased by £40 per annum for three years.

Lord Windsor, the First Commissioner of Works, has intimated to the urban district council of Barry that it is his intention to construct a promenade, at a cost of £5,000, along the whole extent of the foreshore, from Friar's Point to Nell's Point.

The war memorial which has been erected in the Queen's Park, Crewe, to commemorate the services of the Crewe Reservists, Volunteers, and others who took part in the Boer war, was unveiled on Saturday by Lord Stalbridge (chairman of the L. and N.W. Railway). The monument faces the pavilion, and is constructed in Aberdeen granite. Above a square block, with panels in bronze, is a pyramidal finial crowned with an Ionic capital, supporting a figure of Tommy Atkins, showing rifle, bandolier, belt, pouch, and water-bottle. On the front of the monument, which was erected by Messrs. J. Whitehead and Sons, of Westminster, stands a model in bronze of Mr. F. W. Webb's latest type of 7ft. 4-wheeled-coupled compounds (four cylinders). This was designed by two Crewe workmen, Mr. J. H. Lightfoot and Mr. R. Bebbington.

Councillor W. H. Barrett, estate agent, Deansgate, Manchester, the chairman of the Salford Corporation Improvement Commission, has been placed on the Commission of the Peace for Salford.

COMPETITIONS.

GREAT HARWOOD.—In the limited competition for new central co-operative stores, shops, and public hall, to cost £11,000, in which, as we mentioned last week, the assessor has awarded the first premium to Mr. Fred. J. Parkinson, of Blackburn, the second and third premiums respectively have been awarded to Mr. Walter Stirrup and Mr. H. S. Fairhurst.

HEYWOOD FREE LIBRARY.—The conditions for the competitive plans and designs for the new library have been issued. No style of architecture is specified. This is left to the competitors; but it is suggested that it shall be of an imposing and ornate character, and that the elevation to Church-street shall be of stone. The cost of the buildings, boundary wall, gates, and other items must not exceed £4,500, the intention of the committee being that the whole scheme, complete with furniture, shelves, counters, fittings, supervision costs, and architect's fees, shall not exceed £6,000. Three premiums are nominally offered for the designs, of £30, £20, and £10 respectively; but the premium in the case of the architect selected to carry out the work will be merged in the commission. The date for sending in designs in this competition, advertised in our last two issues, has been extended by the town council from September 14 to October 1.

NEWARK-ON-TRENT.—The governors of the Magnus Grammar School, Newark, recently advertised for designs, offering premiums of £25, £15, and £10 for designs which "the governors may adjudge to be of sufficient merit, and place first, second, and third." The designs were returned with a lithographed letter to the effect that none of them were considered to be satisfactory. No premiums were awarded, and it has ended in the matter being placed in the hands of a local firm. In the advertisement, "Architects who have had experience in building technical schools" were invited to compete. Our correspondent, who has recently carried out more than one group of secondary schools, and who cannot, therefore, be regarded as inexperienced in planning, although he would not, we should think, claim an intimate knowledge of "building" such structures, adds: "I suppose the sixteen of us who competed are helpless in the matter. I imagine this was a settled affair from the first."

The memorial-stone of the public library, town and recreation-hall, and municipal buildings for Stornaway was laid last week by Major Matheson, proprietor of Lewis. Provost John Anderson explained that the buildings were undertaken for the purpose of supplying a much-felt want by giving shelter to the 2,500 Royal Naval Reserve men and fishermen who frequented the port during the herring fishing season. The total cost of all the buildings will amount to £11,000.

Mr. W. B. MacCabe, M.Inst.C.E., assistant to Mr. Spencer Harty, city engineer of Dublin, and who has been for some years past in charge of the Dublin waterworks, has been appointed chief engineer of Calcutta.

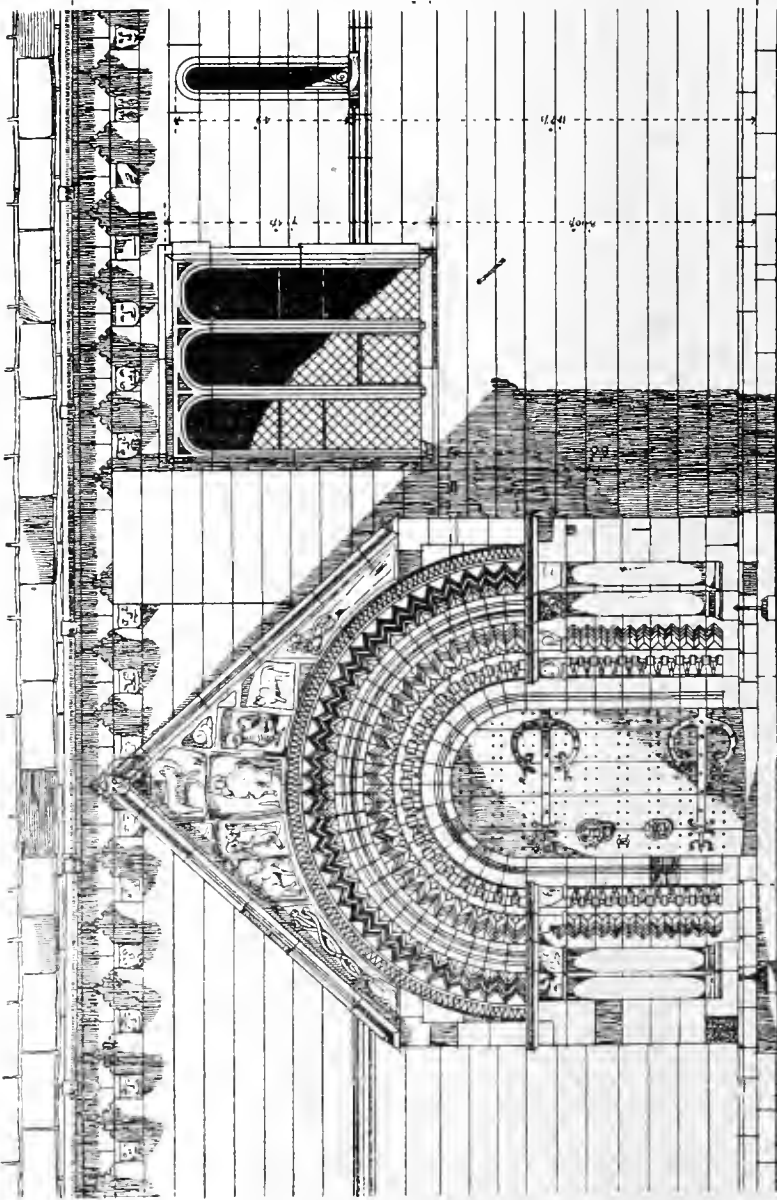
During excavations at Staylittie, Llanidloes, Mont., an ancient burial urn of the Bronze Age was found deposited in an inverted position under 7ft. of earth, surrounded by and imbedded in stiff blue clay. It contained charred human remains. The urn is of rude earthenware, slightly baked in a slow fire, and bears the rudest ornamentation, with herring-bone pattern around the rim. The diameter of the top is 15in., base 6in., depth 13in. The computed age is 2,000 years.

Important drainage investigations are being conducted as part of the irrigation studies which Mr. Elwood Mead is directing for the United States Department of Agriculture. Drainage ranks next in importance to reservoir construction in the arid and semi-arid regions of the States. Large areas have been rendered unfit for cultivation by an excess of water, which drainage will restore to productiveness. In addition, considerable water now lost by evaporation from marshes and shallow ponds can be made available for use elsewhere by constructing ditches.

The Jackson Park sewerage system, which is about to be constructed by the board of local improvements of Chicago, is planned to drain 6,200 acres between Sixty-ninth and Eighty-seventh streets, Ashland-avenue, and Lake Michigan. The system of sewers, planned by Mr. C. D. Hill, the engineer of the board, is for a large part below the lake level, and will converge to a pumping-station at Seventy-third Street and Railroad-avenue, where the sewage will be raised 6ft., and discharged into an intercepting sewer now under construction. The cost of the work is estimated at £175,000 sterling.

THE PORCH. CHURCH OF ST. JOHN BAPTIST, ADEL.

No. 6.



ELEVATION

PLAN

SECTION

REFERENCE
 NORMAN 1075-1130
 17TH CENTURY

MEASURED AND DRAWN BY
 FRED WADE & JOHN A. WALKER

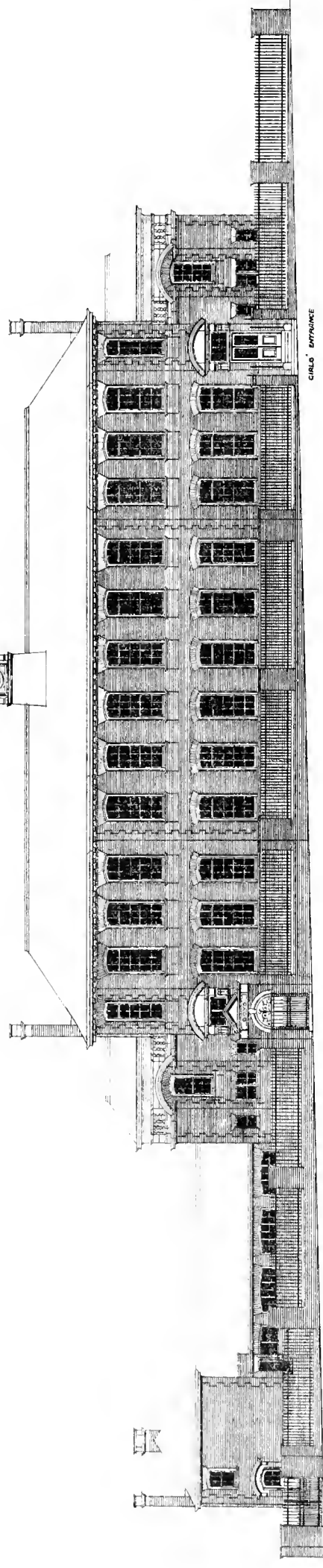
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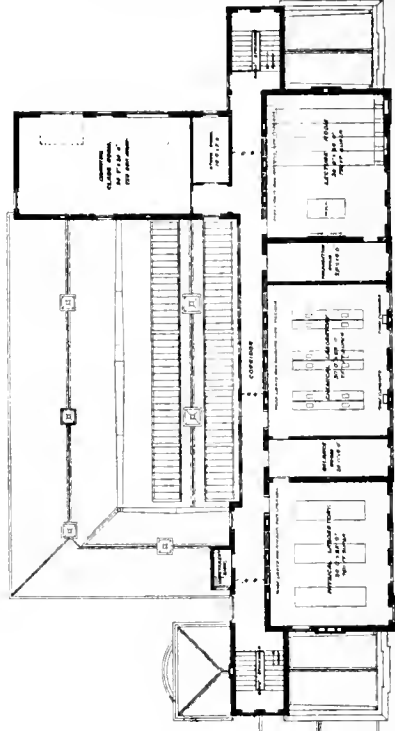
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NEW HIGHER GRADE ELEMENTARY SCHOOL FINCHLEY.
W G WILSON ARCHT.



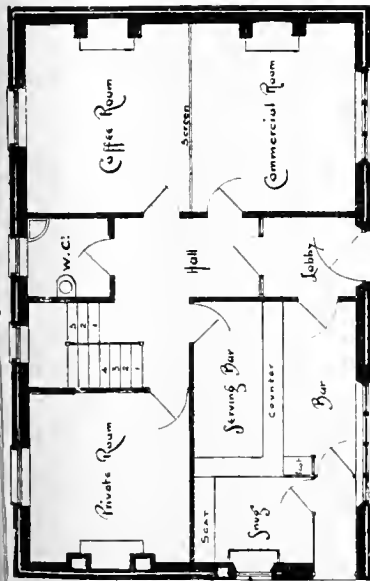
Architectural floor plan of the 1st floor of the 'NEW YORK' building. The plan shows a central hall (60' x 30'0") with multiple elevators and stairs. Surrounding the hall are various rooms including Class Rooms (e.g., 40' x 30'0", 30' x 30'0"), Class Rooms (e.g., 40' x 30'0", 30' x 30'0"), and a large Meeting Chamber (40' x 30'0"). The plan also includes a Gymnasium (40' x 30'0"), a Library (40' x 30'0"), and a large Hall (40' x 30'0"). The building has a main entrance on the right and a side entrance on the left. The plan is labeled 'NEW YORK' and '1ST FLOOR'.

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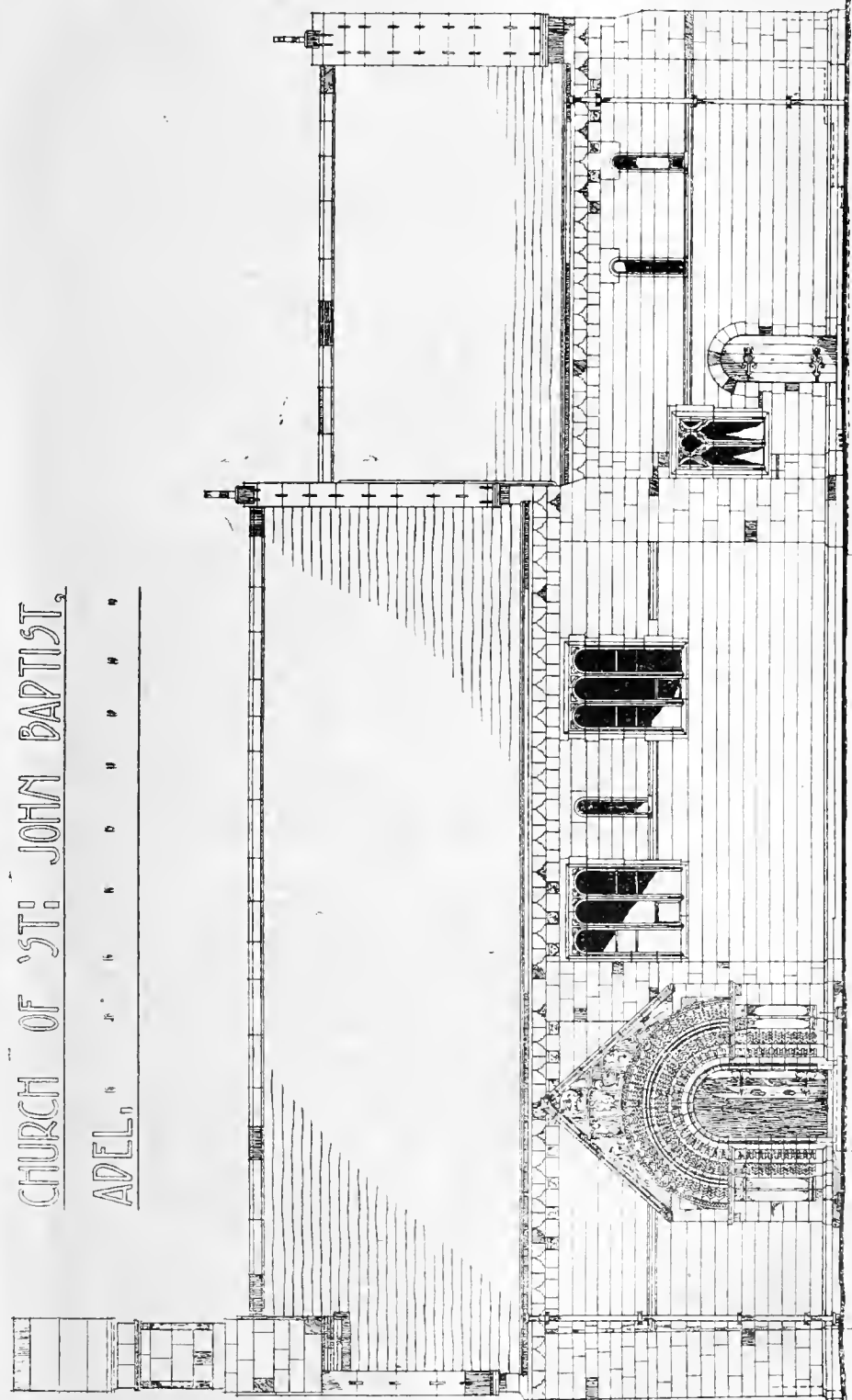


GROUND FL 000 FL 4 M

Railway Hotel Lyme Regis
for Messrs Mitchell Toms & Co. Ltd.
Architect Chard 1903



CHURCH OF ST. JOHN BAPTIST,
ADEL, N. H.



WALL AND MOLDINGS
ARE 4 1/2 INCHES OUT OF
THE PERPENDICULAR

SOUTH ELEVATION

MEASURED & DRAWN BY
FRED WADE AND
JOHN A. WALKER



Building Intelligence.

BARTON HILL, BRISTOL.—New baths have been erected in Maze-street by the corporation. The exterior is exceptionally plain; but internally all the requirements of a first-class bathing establishment are provided. The swimming-bath tank is 75ft. by 30ft., the water being 3ft. 6in. deep at one end, and 6ft. 6in. deep at the other. The tank is lined with white glazed brickwork with white glazed scum trough. The floors of the gangways are of terrazzo, with sandstone kerb, &c. A shower-bath and foot-bath are also provided. Forty-three dressing-boxes are made to fall back against the wall. The main walls are lined with glazed bricks to a height of 7ft., and are finished above with painted Keene's cement, and roofed with steel principals, boarded, and having lantern light. A gallery for spectators is provided over dressing-boxes, giving 280 seats. In the winter-time the swimming-bath will be converted into a public hall by flooring over the plunge bath at gangway level. The slipper baths are grouped in compartments, formed by glazed brick walls 7ft. high, with open timber roofs having lantern lights. There are ten slipper baths for women, six first-class and eighteen second-class baths for men, besides two Kane's baths. The engineering work has been carried out by Messrs. Thomas Bradford and Co., of London, Manchester, and Liverpool. The building is lighted throughout by electricity. The general contractor is Mr. A. J. Beaven, of Dean-lane, Bristol. The sketch plans were designed by the city engineer, and the architect is Mr. W. S. Skinner, of Edinburgh Chambers, Baldwin-street, Bristol. The amount of contract for the building work is £13,680, and for engineering close on £3,000. Mr. James Hurn acted as clerk of the works.

COLWYN.—The Bishop of St. Asaph opened and dedicated, on Friday, the new church in Station-road, Colwyn, which is intended for the English services. The church is built of Penmaen limestone, with dressings and windows of red Hollington sandstone, with which material it is lined throughout. The style is Gothic, and the edifice comprises a chancel, nave, and side aisles. Within the nave and aisles there is accommodation for about 450 adults, and the area under the tower is intended to accommodate 60 more. The internal roof of the chancel is of oak, and that of the nave and aisles of pitchpine, and the flooring of the two latter parts of the building is of pitchpine blocks. There are six stained-glass windows. The font is of white Yorkshire stone, with green marble shafts and carved oak cover. The seating in the nave consists of oak benches, and that of the aisles of chairs. Messrs. Douglas and Minshall, of Chester, were the architects.

HASWELL.—On Saturday last the foundation-stone of the Church Hall about to be erected at Haswell was laid. The building is to consist of a hall 55ft. by 27ft., with committee and retiring rooms, also room for the caretaker in connection with the adjacent parish church. It is to be built of brick, with stone dressings, and the roof over the hall will be curved timber trusses with Venesta boarded barrel ceiling. The architectural appearance will be Domestic Gothic, harmonising with the architecture of the church. Mr. R. Wade, of High Moorsley, Hetton-le-Mole, is the contractor, who will erect the building from the design prepared by Mr. George Fox, A.R.I.B.A., 18, Mecklenburgh-square, London, W.C.

KINGSWOOD HILL, BRISTOL.—A hospital is about to be built at Kingswood Hill, to be known as the Cosham Memorial Hospital. The building, which will accommodate forty-four patients, has been designed by Mr. F. Bligh Bond, of Bristol. The building is treated in an Early Georgian style, the materials chosen being a red Pennant facing stone with Bath-stone dressings, and the roofs will be covered with Cumberland slates. The building consists of a main central block, containing the administrative department, and running east and west, and at the western extremity, lying north and south, are the wings containing the wards. The main entrance will have a pediment supported by coupled Corinthian columns. The tower, which is octagonal in form, is terminated with a cupola rising to a height of 100ft. A well-staircase, having a central space to take a full-sized bed lift, leads to the upper floor, which is devoted to nurses' bed and sitting-rooms, matron's bedroom, &c., whilst the attics

on the second-floor provide sleeping accommodation for the servants.

MUNDESEY.—The old parish-church, of which all but the western portion of the nave has long been in ruins, has, during the last few months, been undergoing restoration. Only the western half of the nave and a small quasi chancel, which stood within the walls of the old nave, have till now been available for divine service. Prior to the restoration the seating accommodation was only 200, but an additional 150 seats having been provided, the church will now seat 350. The work undertaken has included the removal of the ugly pyramidal roof, with its flat plaster ceiling, and of the temporary chancel, and the restoration of the whole of the nave and a portion of the original chancel. A new cross-braced and framed roof has been erected over the nave, the wide span of the roof rendering it necessary to provide massive tie-beams in order to prevent any outward thrust upon the old walls. The chancel, organ-chamber, and porch have had similar framed and moulded roofs, without the beams, and all have been covered with Broseley tiles upon a layer of felt. An organ-chamber has been built on the north side of the nave. The walls of the vestry at the west end of the nave have been raised several feet, and the new roof covered with Broseley tiles. The ruined portion of the chancel walls has been repaired by Mr. Clark, of Mundesley, in order to prevent further destruction, as it is hoped that the entire chancel will eventually be restored. The contractors were Messrs. Wilkins and Randall, of Norwich and Mundesley. Mr. Arthur J. Lacey, diocesan surveyor, Norwich, was the architect.

SCOTSWOOD, NEWCASTLE-ON-TYNE.—The Delaval Arms is the name of a new building which has just been erected at Scotswood by the Northumberland Public House Trust Co., Ltd., to be opened on Monday next. The lower story is of brick, and the upper is finished in rough-cast, with moulded boards to the gables. The roof is of red tiles. In the front there are stone and mullion windows, with metal casements. The main entrance is on the south side, in the centre of the building. The arch porch is in oak, and the walls in the halls are panelled, while the ceiling here, and also of the principal rooms, exposes the joists, the spaces between which are plastered. The main part of the ground floor is occupied by a dining-room, wherein sitting accommodation is provided for 150 persons. The general contractor was Mr. S. F. Davidson, of Newcastle, and Messrs. Cackett and Burns Dick, of Newcastle, were the architects.

TAMWORTH.—The foundation-stones of the new infirmary which is being erected in connection with Tamworth Workhouse were laid on Friday. The infirmary comprises three blocks. The central portion, which is to be three stories high, will be the administrative block, containing nurses' rooms, kitchens, bathrooms, surgery, and special ward. The south block will be devoted to female patients and the north to males. Each portion will be of two stories, and will contain 24 beds, the total accommodation of the infirmary being 60 beds. The building will cost £8,792.

The *Peterborough Advertiser* states that an old-established German firm of engineers are about to build engineering works near Westwood Bridge in that city, and they are in negotiation with the Ecclesiastical Commissioners, to whom the Westwood-street allotments belong, for the purchase of six acres of land. When the works are in full swing some 300 men will be employed.

An inquiry was held by Mr. Gordon Hogg, coroner, on Saturday, at Harrow, on the body of Frederick Horsman, 56, foreman to Messrs. Kingler, builders, of Oxford, who died from injuries sustained by the fall of a wall 12ft. high and several tons of earth, while he and some workmen were excavating under the wall at one of the Harrow School houses. William Collinson, a labourer, said he was working with deceased, and under his orders. Horsman, who was the only man who did not get away, for a time was working 4ft. above him, and although he was a skilled man, he had no idea that the wall would give way. Deceased had already ordered struts to be prepared, and a hole was dug to put them in. It was mentioned that two of Mr. Horsman's sons were working on the job, and saw their father dug out. Mr. Edwards, clerk of the works, produced the plan for the enlargement to Grove House, and said every precaution was taken to prevent accident. A verdict of "Accidental death" was returned.

Engineering Notes.

CONNEL AND BALLACHULISH RAILWAY.—Colonel Yorke, on behalf of the Board of Trade, made an official inspection of the new Ballachulish line on Friday. The inspection commenced with the Connel Ferry Bridge, which spans Loch Etive, and connects the new line with the Callander and Oban Railway. This bridge, which, next to the Forth Bridge, is the largest cantilever bridge in Europe, has a clear span over the sea of 500ft., and the rail level is upwards of 50ft. above high-water mark. Nine Caledonian engines coupled, and four 30-ton waggons, having an aggregate weight of about 1,000 tons, were employed as a test, and were first passed very slowly over the bridge, stopping frequently. Afterwards this heavy train was run over the bridge several times, each time at increased speed. After completing the inspection of Connel Ferry Bridge, which has been designed by Sir J. Wolfe Barry, and erected by Sir William Arrol and Co., Glasgow, Colonel Yorke, who was accompanied by the principal engineering officials of the Caledonian Railway, proceeded to Creagan Bridge, where the same tests were applied. Creagan Bridge crosses Loch Creran at Creagan Narrows, but is a less imposing structure than Connel Bridge. It is a girder bridge, with a pier in the centre, and its rail level is about 30ft. above high-water mark. The inspection of the railway, which is 26 miles in length, was continued on Saturday.

HARTLEPOOLS DOCK IMPROVEMENTS.—Mr. Newell, of Hull, the dock engineer to the N.E.R. Co., with Mr. Kirkup and Mr. Nicholson, the company's representatives in the Hartlepoons, has met a deputation representing the corporations of both boroughs, the local Chamber of Commerce, and other bodies, respecting the projected scheme of dock and harbour improvements, and submitted plans showing the modified proposals of the company. The company have abandoned the scheme for converting the present harbour and Victoria Dock into a large tidal harbour, and now propose to let the dock remain as at present, except that additional coal drops with modern appliances, and deep-water berths will be provided. The slake, behind the present fish quay, it is proposed to convert into a tidal basin, having a water area of 11 acres, with an entrance from the old harbour 80ft. in width, and to remove the fish quay to the east side of the new basin, where, it is estimated, quay space 600ft. in length would be available. The deputation strongly urged the need for a better entrance and additional quay accommodation for the timber import trade, and submitted a suggestion for the widening of the entrance to the old harbour by the removal of the projecting portion of the dock-head near the Hartlepool Custom House. Those matters the company's officials undertook to lay before the directors.

CHIPS.

At the last meeting of the town council of Brighton it was decided to apply to the Local Government Board for permission to borrow £9,792 for the enlargement of the public library.

A new Wesleyan mission chapel is being built at Dol Hey, Moses Gate, near Bolton. The building is designed to seat 450 persons, and is to cost £2,000.

At the last sitting of the Ayr Dean of Guild Court plans were passed for the erection of 46 dwelling-houses in the burgh, the estimated cost of which is £12,200.

Mr. R. H. Bicknell, M.I.C.E., of the Local Government Board, attended at Hurworth-on-Tees on Friday to inquire into an application of the Darlington Rural District Council for powers to borrow £1,150 for carrying out the necessary works in connection with the Hurworth-place sewage disposal scheme. Mr. W. Fawcett, acting clerk of the council, and Mr. Balfour, C.E., of Newcastle, gave evidence.

At Bala a pedestal has just been completed by the urban district council for a statue of the late Mr. T. E. Ellis, M.P., in the High-street. The memorial itself is being cast in bronze from a model fashioned by Mr. Goscombe John, A.R.A., and will shortly be erected and unveiled.

Among the Salford Corporation's new tram lines inspected and passed on Wednesday in last week is one leading through Eccles and Monton. When this route is opened passengers will be able to travel by it as far as Worsley, from which point there will be practically a direct line to Bolton.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

Telegraphic Address:—"Times-News, London."
Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., L., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Situations and Partnerships.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

* * * Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—W. A. and Co.—F. T.—A. M.—R. P. and Co.—S. B.—T. L. J.—G. P. K.—M. E. G.

J. AND W. STEWART.—Our abstract was taken from one of the American technical papers. The paper may possibly be printed in full in the *Proceedings* of the society referred to, the headquarters of which we think are at Chicago. Drop a postcard to the secretary.

Correspondence.

SKETCHES IN NORMANDY (?)

To the Editor of the BUILDING NEWS.

SIR,—There seem to be slight mistakes on both sides. Dol is in the Department of Ille-et-Vilaine, in Brittany, and the sketch of the porch to its cathedral's south transept (*BUILDING NEWS*, August 7, p. 171), which Mr. Andrew Oliver in to-day's issue attributes to Mr. Weatherley, as a matter of fact, is signed "Regd. T. Wheatley."

The triple hollows to each of the south, west, and east arches of the porch in question have been filled for some time by plaster models of sculptured figures (forty-two in each), and above these arches, occupying the wall space between them and the parapets above, are also models of sculpture. These occur in thirty-six

panels, each 2ft. 6in. square. They crudely represent various incidents in the Life of Our Lord. I referred to them in an article entitled "Lannon, the Land of Great Stones," in the *BUILDING NEWS* for Oct. 17 last.—I am, &c.,
Fair Park, Exeter, Aug. 14. HARRY HEMS.

TRURO CATHEDRAL.

SIR,—May an old bell-ringer and clockmaker ask where are the belfry or ringing chamber, and the bell-chamber which must be over it? And any way to the tower-top? Is it going to rival the tower of the London Law Courts, where every stone landing had to be cut through after it was built? Mr. Snell's description is silent about them all.—I am, &c.,
Aug. 15. G.

Intercommunication.

QUESTIONS.

[11993].—**Turkey Houses.**—The writer would be pleased and obliged if any reader would give him information respecting the sizes and arrangements of turkey houses for breeding purposes and for stock. They are to be erected in connection with a model farm.—TURKEY.

[11999].—**Acoustics.**—A village church is considered acoustically defective. There is no echo, but a want of resonance. It has been suggested that some system of wiring might improve matters. Would some experienced reader kindly say if this would be so, or suggest other means which would have the desired effect? The church is 48ft. wide and 60ft. long, in three spans; about 20ft. high to eaves, with open-timber high-pitched roof. The chancel is 16ft. wide by 32ft. long, and about same height as nave, and has a small chapel on one side and organ-chamber on the other.—W. FROGGATT.

REPLIES.

[11993].—**Contractor's Claim.**—I think the contractor is entitled to claim the whole of the £500. Whether he would get it depends on the evidence. It is manifest that in some cases, where plant and materials had to be fetched from a distance, the contractor would stand to lose heavily. In others, he would, perhaps, lose little. The case is one for reasonable compromise between proprietor and contractor; failing which, I should issue a writ for the whole amount and take my chance.—K.

[11997].—**Wood-Block Floor Smelling.**—I do not think there is anything for you to do except to bear the odour. The oil in the teak and acid in the oak are inherent to each. Probably disinfectant washes would be no use, although if you cared to try over a small portion to see whether it affects colour: Sulphate zinc 4oz., salt 2oz., water 1gal. It may vary small.—REGENT'S PARK.

The first portion ready for occupation of the new naval barracks at Portsmouth was taken over by the Admiralty on Friday. Within a short time the whole of the buildings will be occupied. The barracks are the largest in the world. One peculiarity of the accommodation is that the men living in them will not sleep in beds, but in hammocks, slung from the ceiling, as aboard ship.

At Tuesday's meeting of the Sedgley School Board it was decided to instruct Mr. A. Ramsell, architect to the board, to prepare plans for the enlargement of Robert-street Boys' School.

A chancel screen is about to be erected in St. Michael's Church, Middleton-Tyas, in memory of the late Lady Backhouse. The screen is of wainscot oak, and is in five bays, the centre being the doorway, with the head composed of a four-centred arch and quatrefoils and pendants. The Archdeacon of Richmond will formally dedicate the screen, which has been designed by Mr. J. P. Pritchard and Son, of Darlington, and executed by Mr. Ralph Hedley, of Newcastle, on Tuesday, Sept. 1.

At a meeting of the Bromsgrove Rural District Council on Tuesday it was decided to borrow £2,000 for carrying out the sewerage scheme adopted for Alvechurch. The amount of the loan is in addition to a sum of £519 already raised. Plans for the drainage of Clent at a cost of £600 were also adopted.

The town council of Cape Town have adopted the Berg River Hock water supply, and will apply for powers to borrow £2,000,000 for the same. The scheme was prepared by the city water engineer, Mr. R. O. Wynne Roberts, A.M.I.C.E., formerly of Oswestry, and as approved by the town council has now to be submitted to Parliament for final sanction.

The Carnegie free library at Scunthorpe, the foundation-stone of which was laid last week, is being built from plans by Mr. A. M. Cobban, of that town.

The new Roman Catholic church of St. Joseph, which has been erected at Benwell, was solemnly opened on Saturday morning, when Pontifical High Mass was sung by Dr. Preston, Bishop Auxiliary of the diocese of Hexham and Newcastle.

WATER SUPPLY AND SANITARY MATTERS.

LINLITHGOW.—The work of constructing the Linlithgow new sewerage scheme, which was commenced about twenty months ago, is now practically finished, and on Friday the works were inspected by the members of town council, the engineers, and the contractors. The scheme consists of sewers throughout the burgh, and sewage disposal works on the septic tank method, with contact beds or filters. The disposal works are situated on about four acres of ground along the west side of the Mains Burn, which has its outlet in the river Avon, about 400 yards below the works. There are two large contact-beds over which the effluent is passed by distributors for the purpose of aeration. A part of the ground for the works consists of open porous sand and gravel, and this has been converted into land filters, which take the effluent from the contact-beds, and so complete the final stage of purification of the sewage before the effluent passes into the stream adjoining the works. The entire scheme has cost about £14,000. The engineers are Messrs. Warren and Stuart, C.E., Glasgow.

CHIPS.

At Ticehurst on Wednesday week, Mr. Sweeting, one of the inspectors of the Local Government Board, held an inquiry at the Union House as to the application of the rural council for a loan of £2,000 for an infectious hospital. Mr. Caley, of Tunbridge Wells, submitted the plans, which he has prepared.

The foundation-stone of a new Wesleyan chapel at Leeming, near Bedale, was laid on Friday. The new structure is being built on the site of the old chapel, and will seat 160 persons. The cost will be £550.

A large clock has just been erected on the public hall, Bourton-on-the-Water, Glos., by Messrs. John Smith and Sons, Midland Clock Works, Derby. It has been made to the designs of Lord Grimthorpe, and has all the latest improvements.

Messrs. Knight and Parkinson, of Temple Chambers, architects and surveyors, have dissolved partnership. Mr. Samuel Knight will continue to practise at the old premises, and Mr. C. E. L. Parkinson has taken offices at 41, Bedford-row.

It has been decided to build at Felixstowe Dock a 200-quarter steep malting for Messrs. J. Gough and Sons, of Bury St. Edmunds, and also to erect eight workmen's cottages, four to be used in connection with the malting, and the other half for dock hands. The Felixstowe Dock Company have resolved to develop the north quay, so as to provide extra berthing accommodation. This work will entail a cost of upwards of £10,000, and the malting, cottages, and concomitant sidings and connections with the Great Eastern Railway system a further £20,000.

At Elgin, on Wednesday, Mr. George Cooper formally handed over for the benefit of his native town Grant Lodge and 50 acres of adjoining land which he has had laid out as a public park and recreation ground.

The Copley Society of Boston, Massachusetts, announces a Memorial Exhibition of Whistler's works, to be held in Copley Hall, Boston, next winter. The exhibition will open on Tuesday, Feb. 23, 1904.

At the tenth half-yearly meeting of the Baker-street and Waterloo Railway Company, the chairman reported that the total expenditure on the line since its commencement had amounted to £1,255,410. The western-running tunnel between Waterloo and Baker-street was through, and the eastern tunnel would be through in about seven weeks. The running tunnels had been commenced on the extension to the west of Baker-street. An agreement with the Crown had been made for a station site in the Marylebone-road, and the purchase-money had been paid. On the Southern, or Elephant and Castle, extension the lift shafts had been sunk at the Kennington-road Station; at St. George's-circus the running tunnels were being pushed forward in both directions; and at the depot site a large amount of excavation had been done.

For the post of master of works to the Glasgow Parish Council and District Lunacy Board no fewer than 130 applications have been received from architects, engineers, and others. The committee entrusted with consideration of the applications will meet shortly.

A memorial to Messrs. R. and H. Fearon, two brothers who met their death on the summit of the Matterhorn, when on a holiday tour in Switzerland last year, has just been erected in the church of All Saints', Plumpton, Sussex. The memorial takes the form of a Caen stone pulpit, with the figures of Our Lord, Moses, and Elias in large panels as a representation of the Ascension. The work has been designed and executed by Messrs. Jones and Willis, of 43, Great Russell-street.

LEGAL INTELLIGENCE.

SPALDING ARBITRATION.—At the Sessions House, Spalding, on Thursday in last week, the arbitration case of "Baker v. Neal," which had been remitted from the Lincolnshire Assizes, was heard before Mr. William Scorer, architect, of Lincoln, who was selected as the arbitrator. The claim was one by Mr. Baker, builder, of Moulton Chapel, near Spalding, against Mr. Neal, farmer, of Pinchbeck, Spalding, for work done in erecting a house for him. The case lasted five hours, numerous witnesses being called. Plaintiff claimed that he was entitled to £100, being the balance of the contract, which in the aggregate was for nearly £300. It was stated for the defendant that an expenditure of at least £100 would be required to put the house in a proper condition, owing to bad workmanship and material, and there was a counter claim for this amount. Plaintiff denied the allegations as to bad workmanship, but admitted that the bricks (supplied by defendant himself, being made on the estate) were soft and otherwise defective. After hearing the evidence, Mr. Scorer, the arbitrator, said he would communicate his decision in due course.

"UNDERTAKER" UNDER THE WORKMEN'S COMPENSATION ACT.—An important point under the Workmen's Compensation Act was decided by Judge Owen, at Newport, Mon., County-court on Friday, the point being raised as to whether the respondent in an action, Mr. R. H. Parkyn, builder and contractor, was an "undertaker" in the meaning of the Act. The application was made by the widow of Francis Higgins, a foreman carpenter, formerly in the employ of Parkyn. Evidence was given by a carriage builder named Gwatkin that he employed Parkyn to carry out some alterations to a lift at his premises, and during the execution of these by deceased he fell from the top of the lift well and was killed. Respondent contended that Gwatkin asked him to send a couple of men, and he told him that if he found the material he must also look after the men. From first to last he had nothing to do with giving orders or instructions. His honour said he had preached about insurance ever since the passing of the Act. He awarded £150 to the three children, and the balance of the claim, £131 9s., to the widow.

AGENT'S RESPONSIBILITY FOR COLLAPSE OF COTTAGES.—A charge of manslaughter against the agent of some cottage property in Henry-street, Ancoats, which recently collapsed, killing two of the inhabitants, was heard at the Manchester City Police-court on Friday. In the course of the evidence it appeared that the stability of the houses had been threatened by the unloading of a boiler in the same street, and that the managing director of a neighbouring sawmill had been so struck with their fragility that he had instructed his men to unload logs of wood "as gently as possible." It was stated, however, that the agent had attended to such complaints as had been addressed to him, and the stipendiary magistrate decided that the case was not one which ought to be submitted to a jury. It seems that three cottages collapsed, Nos. 107, 109, and 111, Henry-street. Nos. 107 and 109 were uninhabited, having been condemned about fifteen years ago; in No. 111 lived the family, two children of which were killed. Under all three cottages were cellar dwellings, likewise condemned. This wretched property belonged to a lady living at Southport, who apparently knew nothing about it except that it was managed by a trustee, an estate agent living in Manchester, who had not visited it since 1900. In No. 111 on one occasion "one of the stairs gave way and fell into the cellar"; on another occasion, last March, "the snow came in through the bad places in the ceiling." The tenants had complained of these defects, and they were remedied; but no inspection was made to see whether they were evidence of others. The condemned house next door, No. 109, had, it was stated, lost half its slates, and the rain beat through on to the party-wall, which had also been partially undermined in the cellars.

CLAIM FOR PERSONAL INJURIES.—In the City of London Court, on the 11th inst., William Tyler, scaffolder, 96, Mansell-street, Aldgate, sued Higgs and Hill, Ltd., contractors, Crown Works, South Lambeth-road, for £10, as damages for personal injuries sustained through the alleged negligence of the defendants' servants. Plaintiff was in the employment of Messrs. Lindsay, Neal, and Co., who were employed under a sub-contract by the defendants to do certain work at premises in Moorlane. While he was following his employment near a stack of scaffold boards, which it was said defendants' men had been using, some of the boards fell, striking the plaintiff on the head. As a consequence of the injuries he was out of work for three weeks, his wages at the time being 35s. a week. Dr. Ausler, who attended the plaintiff for a fortnight, gave evidence. For the defence, Carfield, the defendants' foreman, said the stack was not being used by any of the defendants' men. The plaintiffs' employer was, however, using some of the boards. Holmes, an engine-driver employed by the defendants, said that just before the accident

he observed the plaintiff getting boards from the stack. He saw the plaintiff slip and fall towards the basement. No timber fell from the stack. Other evidence was called for the defendants to show that no timber fell upon the plaintiff. It was also said, on behalf of the defendants, that the plaintiff made a claim upon his employers, and was allowed half his wages while laid up. At the end of three weeks he went to work again. The jury found a verdict for the defendants. Judgment accordingly, with costs.

LEEDS WATER ARBITRATION.—Lieut.-Colonel W. H. Wellsted, the umpire upon the claim recently heard at Westminster of Lord Masham against the Leeds Corporation, has just issued his award. The arbitration had reference to the compulsory acquisition of 395 acres of freehold land belonging to Lord Masham for the Leeds new waterworks. The claim was for £196,000, including consequential damage during the construction of the works and afterwards to Swinton Castle, and the interference with the sporting rights, shooting, and fishing on the remainder of the estate, and the timber. The valuations of the expert witnesses called by the corporation amounted to £27,000. The umpire has fixed the amount of purchase at £46,489.

RIVAL LICENSING AUTHORITIES IN LONDON.—At the Westminster Police-court on Friday the London County Council, under the London Building Act of 1894, summoned Mr. A. Carphey, engineer, of 28, Victoria-street, in respect of a composite building for showing a model railway at the rear of these premises. A temporary license for the structure was granted by the Westminster City Council, but, on behalf of the London County Council, it was submitted by Mr. Daldy, barrister, that the local body had no power to do this. Mr. Lawless, counsel for the defendant, said that Mr. Carphey was between two stools. Mr. Daldy urged that the only valid license was that of the London County Council, who held that in some respects this was a dangerous building. If the other side would come to an arrangement the County Council might overlook it. But the other side would not. For the City of Westminster Council, Mr. Rotton said that their license ran till September, and they claimed power to renew. Mr. Sheil: I will not give any immediate judgment on a matter like this. In a case of dispute between two large public bodies there certainly ought to be some better appeal than a fight in a police-court. It was agreed to adjourn the case until a date in September.

A COVENT-GARDEN ARBITRATION.—In the Westminster High Bailiff's Court, on Aug. 12, Mr. John Troutbeck and a special jury had before them the case of "Wyld and Robins v. the Great Northern, Piccadilly, and Brompton Railway Company," a claim for compensation for the compulsory acquisition of the premises, 19, James-street, Covent-garden, required for the purposes of the new Covent-garden station. Mr. Boyle, K.C., said that his clients were market gardeners, and held the premises on a lease, of which 13 years were unexpired, at a rental of £150 per annum. Covent-garden Market belonged to the Duke of Bedford, who exacted a toll varying from 1½d. to 4d. on each package sent in. This property, however, was free of toll, which often amounted to more than the rent. The takings of these premises in 1897 increased the net profits from £1,000 or so a year to an average of £3,537. Their claim was for £9,604. For the railway company, Mr. Alexander R. Stenning said the claimants would be amply compensated if they were paid £2,786, and Mr. Douglas Young assessed the value at £2,300. The jury awarded the claimants £5,435.

RAILWAY CONTRACTORS' CLAIM FOR HALF A MILLION.—Sir Benjamin Baker, sitting as arbitrator, recently commenced the hearing of a claim for £457,084 by Messrs. S. Pearson and Sons, Ltd., the contractors, against the Great Western Railway Co. for work in connection with the direct railway from South Wales to Bristol. Whilst the claimants allege that their actual out-of-pocket loss, exclusive of any added profit, amounts to £312,165, the railway company, on the other hand, say that substantially they have paid everything to which the plaintiffs are entitled. The case was adjourned until after the Long Vacation.

HETTON BUILDER HEAVILY FINED.—At the Houghton-le-Spring Petty Sessional Court last week, before Colonel Gregson, a Hetton-le-Hole builder, named Arthur Errington, was charged on four counts with having contravened the local authority's building by-laws. The case was one which has excited a good deal of interest amongst the local builders, and the court was crowded to hear the trial. Mr. W. Gough prosecuted on behalf of the Hetton-le-Hole Urban District Council. The defendant pleaded guilty to the charges. The surveyor to the council (Mr. Hardy) said the defendant was charged with first giving no intimation to the council of his intention to fill in the foundations; second, having commenced building without having first submitted plans to the council. The other two charges were similar to the first two. The surveyor, continuing, said that the defendant

had been warned, and he had also been asked to attend a meeting of the sanitary and building committee of the council, but had not done so. Mr. Gough said the case was a serious one. The defendant pleaded ignorance of the by-laws. The bench fined him 20s. and costs in each of the four cases.

CHIPS.

For some time past fears have been entertained regarding the stability of the north-east portion of the Castle at St. Andrews, N.B., known as the Kitchen Tower. Slowly the sea has eaten into the rock upon which the Castle is founded until now the walls are actually undermined. Representations were made some few months ago to H.M. Board of Works, which has now sanctioned the expenditure of between £2,000 and £3,000 in building a protection wall the whole length of the northern section of the Castle. During stormy weather the waves strike with tremendous force upon the foundation of the Castle, and the walls are to be of concrete from 10ft. to 20ft. thick. The work is to be undertaken by an Edinburgh contractor.

The Monmouthshire County Council have decided to combine the offices of county surveyor and county architect, and to pay Mr. Tanner £500 as an annual salary, instead of £350 and a gratuity of 4 per cent. for all plans and quantities.

At the town meeting of the Christchurch Town Council the town clerk reported that Mr. Rawlins, architect, of Salisbury, who acted as arbitrator between the council and the owner of Bowditch's property, which the council are acquiring for widening Bargates for tramway purposes, has sent in an award amounting to £497 4s. 4d.

Among the measures which received the Royal Assent at the prorogation were the Housing of the Working Classes (No. 2), Public Buildings Expenses, Irish Land, and Patent Office (Extension) Acts, and 37 private and provisional order Acts.

A Local Government Board inquiry was held at Bexhill on Friday by Lieut.-Colonel A. C. Smith, R.E., inspector, into the application of the town council for sanction to borrow a sum of £1,270 for sewage works and the provision of a storm-water overflow.

Mr. Justice Swinfen-Eady in the Chancery Division had before him on Friday a motion by the Ecclesiastical Commissioners as landlords of the Globe Works, Rochdale, to prevent the defendant Davenport from allowing the property to fall into a state of disrepair. At present there was nobody in possession. On his Lordship's suggestion it was agreed that the Commissioners should have leave to enter and do the necessary repairs.

A new Welsh Congregational church has been erected on the banks of the Dee at Llangollen, and the new edifice was opened on Sunday. The church has been erected, at a total cost of £3,100, from designs by Messrs. O. Morris Roberts and Sons, Portmadoc, the contractor being Mr. D. Roberts, Llangollen. The church will accommodate over 550 persons.

A Local Government Board inquiry was held at Newport, Mon., on Friday, into the application of the corporation to borrow £1,200 for new paving works in various parts of the borough. The town clerk and borough engineer explained the purposes to which it is proposed to apply the money.

A receiving order has been made in the case of John Richard Winstanley, Barrow-in-Furness, described in the order as a "quantity surveyor and fruiterer."

At an inquest held on Monday at Battersea, with reference to the death of Charles Reuben Bird, aged 60 years, a builder, lately residing at Cobbett-street, South Lambeth, who was fatally injured whilst a passenger by one of the London County Council's electric trams at Balham. A verdict of accidental death was returned. Deceased, who lived in Narbonne-avenue, got off the car when in motion opposite that thoroughfare, and sustained a fatal fracture of the skull.

The demolition of buildings abutting on the National Gallery has now been completed, and the priceless paintings contained therein isolated from any danger of fire from external sources. In the course of the work a large portion of St. George's Barracks has had to be pulled down, and the military authorities have condemned the remainder. At the rear of the National Gallery about an acre of land has been reserved in view of possible extensions of the building in the future.

The Carpenters' Company are offering two free scholarships in connection with the building and construction classes held at King's College, London. Intending candidates should forward their names by Monday, September 14, to Mr. J. Hutton Freeman, clerk, Carpenters' Hall, London Wall. The examination will be held on the following Monday.

Our Office Table.

THE British Fire Prevention Committee's operations for the summer season saw their completion last week with two tests at their testing station in Bayewater, when some armoured wood doors and an armoured concrete floor were under examination. Regarding the armoured door test, this was with tinned steel-clad armoured doors, constructed in Manchester, one being a sliding door and one a hinged door, and they were tested for a duration of one-and-a-half hours under a severe fire of gradually increasing temperature, the highest temperature being over 1,800° Fahr. The sliding door offered substantial resistance against fire. The floor test was with a composite floor of fine concrete, strengthened by steel bands, and constructed by a Swiss firm. The floor was subjected to a test of one-and-three-quarter hours under severe fire at a gradually increasing temperature to 1,800° Fahr., when the floor collapsed. Of other tests now in the report stage is a test with another pair of similar armoured doors. Further, with a floor of Australian Karri wood and with a thin partition, by a Dutch firm. All the reports will be issued in due course. In framing the reports an innovation will no doubt be found, inasmuch as the metric system will henceforward be applied in the committee's reports, as well as our own system of weights and measures, this being in accordance with a resolution arrived at at the International Fire Prevention Congress, requesting all reports of different countries to adopt the metric system as well as their local system of measurement and weight.

A NEW code of regulations dealing with the demolition of buildings within the City, and seeking to afford better protection to the public from dust, has been issued by the Streets Committee of the City Corporation, whose members have been assisted with suggestions by the Royal Institute of British Architects, the Surveyors' Institution, and the Institute of Builders. The new by-laws provide that in the future, before any demolition takes place, all windows and other openings in the external walls shall be close-boarded. Canvas or boarded screens, mats, and other suitable appliances must be used whenever required, and so placed as to reduce the nuisance arising from the escape of dust. Rubbish, lime, or mortar must not be shot or allowed to fall from floor to floor into any basement within 20ft. of the public way between 10 a.m. and 6 p.m., except on Saturdays, when it will be permitted after 3 p.m. Further, no materials arising from the demolition of buildings shall be basketed, wheeled, or loaded into carts, or carted away between 10 a.m. and 6 p.m. except on Saturdays, unless proper provision has been made for the protection of the public from dust. Any person who commits an offence against the new by-laws will be liable to a fine of 45 for each breach.

Two short extensions of the tramway routes in South London which have been converted for the London County Council from horse to electric traction were opened at the end of last week. These extensions cross one another to the south of St. Mark's Church, Kennington. The one is a continuation of the tramway system from the north end of Camberwell New-road by way of Harleyford-road and the Oval to Vauxhall Station; this section, formerly single, is now a double line throughout, and part of Harleyford-road has been widened for this purpose on the east side. The second route, a very short one, extends from Kennington Gate along the northern portion of the Brixton-road (which has been widened) to the Fire Brigade Station in that thoroughfare. By the electrification of this short link, which has been in progress for some weeks, cars can be drawn by electric power from Westminster, Waterloo, and Blackfriars bridges, to the fire brigade station, and thence through Brixton and Streatham by cable propulsion, as hitherto. The works on these sections have been carried out by Messrs. J. G. White and Co., of Clapham. The electrification of the two routes from the Elephant and Castle to Greenwich via New and Old Kent-roads, and via Walworth, Camberwell, and Peckham thoroughfares converging at New Cross Gate to the eastern terminus, is making good progress.

The Calendar for the ensuing session of the Glasgow and West of Scotland Technical College has just been published as a substantial cloth-bound octavo volume of 326 pages. The day classes open on Monday, September 21st prox.,

and will close on March 31, 1904. The department of Architecture and Building Construction is, as in former years, under the guidance of Professor Charles Gourlay, B.Sc., A.R.I.B.A., who is assisted by an able staff, including Messrs. J. S. Boyd, Jas. Brown, Charles Forsyth, Alex. T. Heathcote, W. P. McKechnie, and Archibald Scott. We note in the syllabi of this department that Course I. in "Building Construction" has been entirely rearranged, and specially suited for Scottish students; while Course III., "Design of Building Structures," has been remodelled.

MESSRS. EASTON AND CO., LTD., send us an excellent reading case, with an A B C railway guide—we wish it had been "Bradshaw,"—inclosed, which they are circulating among prospective clients in the lift industry as a method of keeping their name before their clients. It is their intention to provide their customers, should they express a desire for it, with the A B C Railway Guide free of charge at intervals in the future. It is of interest to learn that among recent contracts received by this company are lifts for the L.C.C., Admiralty, War Office, H.M. Office of Works, the Midland Grand Hotel at Manchester (19 lifts), and for many members of the aristocracy, and many leading architects all over the British Isles, and that the company's electric lifts especially are being shipped to South Africa, Australia, China, and other British Colonies at the moment. The company's output of lifts has been trebled during the past year.

THE Russian Consul-General in London sends the general rules and classification of the first International Exhibition of Industrial Art for Metal or Stone Products, which is to be held at St. Petersburg in November next. The exhibition will be held in the buildings of the Passage, 48, Nevsky Prospect, and remain open for at least two months, between November 15 (28), 1903, and February 10 (24), 1904. The exhibition has in the first place the object of making the public acquainted with the progress attained by Russian and foreign industry in the artistic finish of metal and stone products. To the exhibition will be admitted articles of Russian and foreign make, produced of metals (precious and common metals and alloys), or trimmed with such metals and alloys, such as articles of stones (precious stones, stones of a certain value, and artificial stones). All these articles must absolutely distinguish themselves through their artistic execution or some originality in their shape, design, or way of production. Cumbrous and very heavy objects are not admitted. Special freights and exemption from import duties on certain conditions have been arranged for all exhibits by permission of the Minister of Finance, and awards for the best exhibits will be distributed according to the decision of the jury. Further particulars can be obtained from the Russian Consulate-General, 17, Great Winchester-street, E.C.

The Corporation of Oldham have obtained the sanction of the Local Government Board to borrow £62,000 for tramway plant and street widening, and £17,000 for electrical equipment of the lines.

Mr. Charles Sanford Terry, M.A., lecturer in history for the past five years in Aberdeen University, and who previously occupied a similar post at the Newcastle College of Science, has been appointed to the newly-instituted Burnett-Fletcher Chair of History and Archaeology.

On Friday last the new church room in connection with St. George's Church, Llandudno, erected in memory of Dr. Kenwick Bold Williams, J.P., Morannedd, was dedicated by the Ven. Archdeacon Morgan, M.A. Mr. Edwin Turner was the architect, and Mr. Thomas Jones the builder. Oak stalls and a clergy desk, designed by Mr. Turner, and executed by Mr. Jones, have also been placed in the chancel of St. George's Church.

The new pulpit which is being made as a Victorian memorial for Whippingham Church is nearly completed. It is in oak, carved in a simple design prepared by Mr. Nutt, the architect to the Dean and Chapter of St. George's Chapel, Windsor, and is being produced by English workpeople. The old pulpit has been removed, and for the time being sermons are delivered from a lectern.

The total cost of the new buildings required in connection with the extension of Glasgow University will be between £90,000 and £100,000. Estimates to the extent of about £70,000 have already been accepted for the various works connected with the scheme, exclusive of painting, heating, electric lighting, and fittings generally, which are expected to entail a further expenditure of about £30,000.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN JULY.—The monthly memorandum prepared by the Labour Department is based on 3,383 returns—viz., 2,087 from employers or their associations, 1,231 from trade unions, and 65 from other sources. Employment continued, it is reported, to show a falling off in July, as compared both with June, 1903, and with July, 1902. In the 226 trade unions, with an aggregate membership of 555,743, making returns, 27,391 (or 4.9 per cent.) were reported as unemployed at the end of July, as compared with 4.5 per cent. in June, and 4.0 per cent. in the 222 trade unions, with a membership of 555,169, from which returns were received for July, 1902. The mean percentage of unemployed returned at the end of July during the past decade was 4.0. In the building trades employment continues moderate, and shows little change as compared with either a month or a year ago. The percentage of unemployed trade union members among carpenters and joiners was 3.3 at the end of July, compared with 3.4 at the end of June, and 2.9 a year ago. The percentage for plumbers was 6.7 at the end of July, as compared with 7.6 in June, and 6.5 in July, 1902. The total number of workpeople involved in disputes which began or were in progress during July, 1903, was 10,100, compared with 12,314 in June, 1903, and 116,814 in July, 1902. Fourteen disputes began in July, involving 5,132 workpeople, compared with 17 in June, 1903, and 25 in July, 1902. Definite results were reported during the month in the case of 12 disputes, new and old, affecting 5,393 workpeople. Of these disputes, four, involving 2,426 persons, were decided in favour of the workpeople; five, involving 234 persons, in favour of the employers; and three, involving 2,733 persons, were compromised. The changes in rates of wages reported during July affected about 59,100 workpeople, of whom 3,900 received advances and 55,500 sustained decreases. The net effect of all the changes was a decrease of about £1,900 per week. Among the changes reported was an increase affecting 1,500 masons in Edinburgh.

ABERDEENSHIRE MASONS.—At a special meeting on Friday night of the Building Branch of the Aberdeen United Operative Masons and Granite Cutters' association, a reply was read from the employers' Association regarding the request by the branch that the wages of wallers and blockers should be increased ½d. per hour. In this communication the employers declined to make any change, as they did not think the state of trade warranted them in doing so. The meeting decided by a large majority to put the matter to arbitration, in terms of the agreement regulating all disputed points in the trade.

ARDROSSAN MASONS.—The strike of masons in Ardrossan district is now ended, and the men have gone back to work. The agreement is to the effect that wages will be paid at the rate of 9½d. per hour till September 1. From September 1 onwards the rate of wages will be 9d. per hour.

CHIPS.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £12,945, as against £19,805 for the corresponding week of last year.

Special authorisation has been issued to the Deutsche Strassenbahn-Gesellschaft, of Dresden, to equip a short section of their existing tramway lines on the Kingsland surface contact, preliminary if satisfactory to the extension over the Dresden tramway system generally. This system of tramway traction has been developed by Mr. F. S. Bolton.

The workhouse at West Mallig, Kent, is being enlarged at a cost of £10,000, from plans by Mr. W. L. Grant, architect.

Dr. Whiteside, Roman Catholic Bishop of Liverpool, laid on Saturday the memorial-stone of a new industrial school for girls, which is being erected at a cost of £10,000 at Blackbrook, near St. Helens. It will accommodate between 120 and 150 girls.

Mr. W. Harston, who recently tendered his resignation as surveyor to the urban district council of Dartford, has been presented with a handsome silver salver in recognition of his fifteen years' service under the authority. The gift was accompanied by an address, and the subscribers consisted of the past and present members and officials of the council.

The town council of Ludlow have decided to provide an electric light installation and to erect a refuse destructor at a total estimated outlay of £8,250.

The lofty tower of St. Mary's Church, Happing-burgh, is about to be repaired from plans by Mr. A. J. Lacey, diocesan architect, Norwich, ominous cracks having revealed themselves in the western wall surface.

LIST OF COMPETITIONS OPEN.

Blackpool—New Offices, Sefton-street.....		C. Arthur, 34, Victoria-street, Blackpool.....	Aug. 31
Howden, Yorks.—Sewerage Improvement.....	£15	Henry Green, Clerk, R.D.C. Offices, Howden, Yorks.....	Sept. 12
Stonehaven—Additions to Town Hall.....		George Murdoch, Burgh Surveyor, Stonehaven, N.B.....	" 12
Ayr—Hospital.....		J. E. Shaw, Clerk to Lunacy Board, County Buildings, Ayr.....	" 22
Leyland, Lancs.—Laying-out land (11,902 square yards).....	£15 15s.	M. H. Wilkinson, Surveyor, 21, Towgate, Leyland.....	" 26
Brighton—Hospital for Women (Assessor).....	£50, £30, £20	Leonard Holmes, Hon. Sec., 76, West-street, Brighton.....	" 29
Dublin—Workmen's Cottages.....		Francis B. Grimsby, Secretary, Kingsbridge Terrace, Dublin.....	" 30
Heywood—Library (£4,500).....	£30 (merged), £20, £10	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood.....	Oct. 1
Bromley, E.—Public Library.....	£75 (merged), £25	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.....	" 2
Saltwood, Elham—Sewage-Disposal Scheme.....	3'gs.	R. Loneragan, Clerk, 11, Cheriton-place, Folkestone.....	" 7
Rawtenstall—Free Library and Town Hall (Assessor).....	£100, £50, £30	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall.....	" 12
Vienna—Machinery to Lift Boats.....	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.....	(1904) Mar. 31
Acton, W.—School (250 places) (Assessor).....	5 per cent.; £30, £20	B. S. Gott, Clerk to Governors, Guildhall, Westminster.....	"
Gillingham—School (900 places).....		E. T. Atchison, Sec., 8, Waterloo-place, New Brompton, Kent.....	"
Fraserburgh—Higher-Grade School (650 pupils).....		Alex. Henderson, Clerk to School Board, Fraserburgh.....	"
Aylesford—Single-Span Stone Bridge over Medway (Assessor).....	100gs.	The Town Clerk, Maidstone.....	"

LIST OF TENDERS OPEN.

BUILDINGS.

Barrow-in-Furness—Alterations to Old Municipal Buildings.....	Corporation.....	The Borough Engineer, Barrow-in-Furness.....	Aug. 22
Lancaster—Shop Front.....	Properties Committee.....	T. Cann Hughes, Town Clerk, Town Hall, Lancaster.....	" 22
Mill of Knockenbaird, N.B.—Alterations to Houses and Farm.....	David Peters.....	Davidson and Garden, 12, Dee-street, Aberdeen.....	" 22
Cork—Premises, 13, George's Quay.....	Mrs. E. Basbforth.....	R. Walker and Son, Architects, 17, South Mall, Cork.....	" 22
Wombwell—Six Houses, Hough-lane.....	Cromdale School Board.....	A. B. Linford, Architect, Carlton Villas, Wombwell.....	" 22
Grantown—Additions to Grammar School.....	Urban District Council.....	Brown and Watt, Architects, Aberdeen.....	" 22
Ilanally—Additions to Lloyd-street Chapel.....	School Board.....	D. L. Jones, Architect, 12, West-end, Llanelli.....	" 22
Colwyn Bay—Isolation Hospital.....	Slough Gas Co.....	Wm. Jones, A.M.I.C.E., Station-road, Colwyn Bay.....	" 24
Newcastle-on-Tyne—School, Forsyth-road.....	Corporation.....	C. S. Errington, A.R.I.B.A., Grainger-st. West, Newcastle-on-Tyne.....	" 24
Slough—Manager's House.....	Guardians.....	R. Martin, Castleview, Slough.....	" 24
Burnley—Wesleyan Church, Manchester-road.....	King's Norton Union Guardians.....	Waddington, Sun, and Dunkerley, Architects, Manchester.....	" 24
Grimsby—Sub-Balancing Station.....	United Building Society.....	W. A. Vignoles, M.I.E.E., Borough Electrical Engineer, Grimsby.....	" 24
Newark—Workhouse Infirmary.....	Town Council.....	A. Marshall, A.R.I.B.A., King-street, Nottingham.....	" 24
Selly Oak—Boiler-House at Workhouse.....	William Ramsey.....	C. Whitwell and Son, Architects, Temple-row, Birmingham.....	" 24
Builth Wells—Rebuilding Portions of St. Mary's Church.....	H.M. Commissioners of Works.....	Telfer Smith, M.S.A., Architect, Builth Wells.....	" 24
Tredegar—Seventy Houses.....	Guardians.....	W. S. Williams, Architect, Tredegar.....	" 24
Montrose—Carnegie Public Library.....	School Board.....	J. Lindsay Grant, Architect, Manchester.....	" 24
Elgin—Rebuilding Business Premises.....	War Department.....	R. B. Pratt, Architect, Bank Buildings, Elgin.....	" 24
Bedlington—Twenty-Six Cottages.....	Joint Hospital Board.....	J. Weeks, Coal Co.'s General Offices, Sleekburn.....	" 25
Birmingham—Enlargement of Head Post Office.....	Meithyr Tydyl School Board.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.....	" 25
Crookston—Poorhouse.....	Joint Hospital Board.....	MacWhannell and Rogerson, 58, West Regent-street, Glasgow.....	" 25
Nuneaton—Infirmary and Laundry.....	Guardians.....	H. Quick, Architect, 64, Hertford-street, Coventry.....	" 25
Peterhead—Additions to North School.....	H.M. Commissioners of Works.....	A. Clyne, F.R.I.B.A., 123, Union-street, Aberdeen.....	" 25
Fort William—School.....	War Department.....	L. and J. Falconer, Architects, Fort William, N.B.....	" 25
Barry Dock, Cardiff—Branch Post Office.....	Joint Hospital Board.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.....	" 25
Woolwich—Pulling Down Buildings.....	Meithyr Tydyl School Board.....	The Royal Engineer Office, Mill-lane, Woolwich.....	" 26
Cork—Additions to Clubhouse.....	Joint Hospital Board.....	W. H. Hill and Son, Architects, 28, South Mall, Cork.....	" 26
Hanley—Additions to Hospital.....	Guardians.....	Elijah Jones, M.S.A., Albion-street, Hanley, Staffs.....	" 26
Tredyfriw—Boys' School (400 places).....	H.M. Commissioners of Works.....	J. Llewellyn Smith, Architect, Aberdare.....	" 26
Portadown—Alterations to Armagh-road Presbyterian Church.....	Webb Bros. and Co.....	T. Houston, Architect, Wellington-place, Belfast.....	" 26
Hanley—Two Cottages.....	Dolton-upon-Deane School Board.....	E. Jones, M.S.A., Albion-street, Hanley, Staffs.....	" 26
Newark—Infirmary Buildings, Bowbridge-road.....	J. J. Thomas.....	Arthur Marshall, F.R.I.B.A., Architect, King-street, Nottingham.....	" 26
Leicester—Enlargement of Head Post Office.....	G. Sedgewick.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.....	" 26
Halifax—Three-Storey Warehouse and Bakery, King-street.....	Borough Council.....	Jackson and Fox, Architects, Rawson-street, Halifax.....	" 27
Abertillery—Crown Inn at Blaenauwent.....	Philip J. Fulham.....	R. L. Roberts, Architect, Abercarn.....	" 27
Halifax—Administrative Block at Workhouse, Gibbet-street.....	Victoria Building Club.....	W. Clement Williams, F.R.I.B.A., Archt., 29, Southgate, Halifax.....	" 27
Goldthorpe—School.....	Huntingdon and Isle of Ely C.C.'s.....	Higginbottom and Wagstaff, Architects, Saltergate, Chesterfield.....	" 27
Amble—House and Shop, Queen-street.....	Docks Committee.....	E. D. Richardson, 7, Gibson-street, Amble.....	" 27
Sedburgh—Two Villas.....	Maldens and Coombe U.D.C.....	W. D. Morgan, Architect, Victoria Chambers, Pantre, Glam.....	" 28
Paddington—Room at Public Baths, Queen's-road.....	Corporation.....	S. Shaw, F.R.I.B.A., Highgate, Kendal.....	" 28
Castle Acre, Norfolk—Oddfellows' Hall.....	Calandrian Railway Co.....	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.....	" 29
Drogheda—Cycle Works, &c.....	Guardians.....	James Spencer, Secretary, Castle Acre, Norfolk.....	" 29
Dowlaish—Rearrangement of Hermon Chapel.....	Joint Sewerage Committee.....	F. H. Tallan, Architect, 356, Kildare-street, Dublin.....	" 29
Rhymney—Twenty-Nine Houses, Rowles-square.....	Urban District Council.....	A. O. Evans, Architect, Pontypridd.....	" 31
Earlth, Hunts—Reconstructing Wood Flooring of Bridge.....	Tramways Committee.....	J. L. Smith and Davies, Architects, Aberdare.....	" 31
Bristol—Tobacco Warehouses.....	Trustees.....	H. Leete, County Surveyor, Huntingdon.....	" 31
New Malden—Public Offices, Fire Station, &c.....	Gloucestershire Education Committee.....	W. W. Squire, Engineer, Cumberland-road, Bristol.....	" 31
Salcombe—Rebuilding East End of Church.....	Corporation.....	Wm. Hope, Architect, Seymour-road, Hampton Wick.....	" 31
Chester—Twelve Cottages, Tower Field Gardens.....	Calandrian Railway Co.....	The Vicar, Salcombe, Devon.....	" 31
Easington—Waiting-Rooms.....	Guardians.....	The City Surveyor's Office, Town Hall, Chester.....	" 31
Bow-road, E.—Repairs to Infirmary.....	Joint Sewerage Committee.....	The Company's Divisional Engineer, General Station, Perth.....	" 31
Thornton-le-Fylde—Air-Compressing Station.....	Urban District Council.....	Edward R. Woodward, Clerk, 61, Bartholomew-close, E.C.....	" 31
Whitcomb—Council Offices.....	Tramways Committee.....	A. Hindle, A.M.I.C.E., 44, Abingdon-street, Blackpool.....	" 31
Sennen Cove, Land's End—Private Hotel.....	Urban District Council.....	J. B. Ranton, Surveyor, Whickham.....	" 31
Manchester—Car-Repairing Works, Hyde-road.....	Tramways Committee.....	H. White, F.R.I.B.A., Penzance.....	" 31
Burton-in-Lensdale—Wesleyan Sunday-school.....	Trustees.....	J. Gibbons, Architect, 25, Cross-street, Manchester.....	" 31
Turnberry—Hotel.....	Gloucestershire Education Committee.....	R. Richardson, Halfway House, Catsfield, Kirkby Lonsdale.....	" 31
Derby—Tramway Car Sheds, Osmaston-road.....	Corporation.....	James Miller, F.R.I.B.A., 15, Hlyewood-square, Glasgow.....	" 31
Aylesbury—Repairing Town Hall.....	Urban District Council.....	J. Ward, A.M.I.C.E., Borough Surveyor, Babington-lane, Derby.....	Sept. 1
Sigford, Axburton—Three Cottages.....	W. Johnstone.....	J. H. Bradford, Surveyor, Town Hall, Aylesbury.....	" 1
Carlisle—Twelve Houses, Margery-street.....	Metropolitan Asylums Board.....	A. Warren, Architect, Buckfastleigh.....	" 1
Tooting Graveney, S.W.—Buildings at Fountain Hospital.....	Tramways Committee.....	Johnstone Bros., Architects, 39, Lowther-street, Carlisle.....	" 1
Halifax—Offices at Skircoat-road Depot.....	Rural District Council.....	T. W. Aldwinckle & Sons, Archts., 2, Denman-st., London Bridge.....	" 2
Abercromby—Carnetown Infant School (250 places).....	Borough Council.....	James Lord, C.E., Borough Engineer, Town Hall, Halifax.....	" 2
Easington—Brick Wall and New Offices.....	Guardians.....	A. O. Evans, Architect, Post Office Chambers, Pontypridd.....	" 2
Trealew—School (300 places).....	Ystradfydw School Board.....	Farthing and Dunn, Architects, Newcastle-on-Tyne.....	" 2
Bermondsey, S.E.—Offices at Town Hall, Spa-road.....	Borough Council.....	J. Rees, Architect, Hillside Cottage, Pentre.....	" 3
Sandown, I.W.—Coastguard Buildings at Culver Cliff.....	Corporation.....	R. J. Angel, A.M.I.C.E., Boro' Sur., Town Hall, Spa-road, S.E.....	" 3
Batley—Town Hall Extensions.....	Metropolitan Asylums Board.....	Director, Works Dept., Admiralty, 21, Northumberland-av., W.C.....	" 4
Batley—Tower to Chapel, Cambridge-street.....	Rural District Council.....	W. Hanstock and Son, Architects, Branch-road, Batley.....	" 4
Dartford—Relaying Floors at Darent Asylum.....	Guardians.....	O. J. Kirby, Borough Surveyor, Branch-road, Batley.....	" 5
Cannock—Infectious Diseases Hospital.....	Ystradfydw School Board.....	T. Duncome Mann, Clerk, Embankment, E.C.....	" 5
Leeds—Rebuilding Office Premises, Albion-street.....	Corporation.....	H. M. Whitehead, Engineer, Penkridge, near Stafford.....	" 7
Bermondsey, S.E.—Electric Station Extensions.....	Trustees.....	Thos. Winn and Sons, Architects, 92, Albion-street, Leeds.....	" 8
Cannock—Laundry Alterations, &c.....	Gloucestershire Education Committee.....	R. J. Angel, A.M.I.C.E., Boro' Sur., Town Hall, Spa-road, S.E.....	" 8
Kingswood—School (900 places).....	Corporation.....	Ashton Veall, 84, Darlington-street, Wolverhampton.....	" 10
Hastings—Lodge at Cemetery.....	Urban District Council.....	John Mackay, Architect, Richmond-place, Kingswood, Bristol.....	" 11
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Armagh—Four Cottages and Dormitory at Asylum.....	Corporation.....	Henry T. Hare, F.R.I.B.A., Architect, 13, Hart-street, W.C.....	" 14
Wem—Market House.....	Urban District Council.....	R. H. Dorman, C.S., Court House, Armagh.....	" 14
Pennyraig—Two New Departments.....	Education Committee.....	James Brown, Architect, 12, Castle-street, Shrewsbury.....	" 14
Birmingham—Engine and Boiler-Houses, &c.....	H.M. Commissioners of Works.....	J. Rees, Architect, Hillside Cottage, Pentre.....	" 16
Portsmouth—Manual Instruction Centres.....	R. D. Spuven and Co.....	Mansergh and Sons, Engineers, 5, Victoria-street, Westminster.....	" 18
Barry Docks—Mercantile Marine Office.....	Edward Hughes.....	A. H. Bone, Architect, Cambridge Junction, Portsmouth.....	" 24
Thurles—Residence.....	Greenlands, Ltd.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.....	"
Whitby—Additions to Bagdale Old Brewery.....	Mrs. F. J. Flower.....	William Maher, Main-street, Thurles.....	"
Glyncorrwg—Four Houses.....		Harold G. Walker, Architect, Skinner-street, Whitby.....	"
Winfrith—Alterations to Winfrith Hall.....		Daniel Lewis, Glyncorrwg.....	"
Bishop Auckland—Minister's House, Cockton-hill.....		F. R. Bates, Architect, Newport, Mon.....	"
Hereford—Furniture Repository, Commercial-road.....		T. E. Davidson, Architect, Newcastle-on-Tyne.....	"
Brampton, Cumberland—Teachers' Residence, Lees-hill School.....		W. W. Robinson, Architect, King-street, Hereford.....	"
Rowhath Chick, St. Osyth, Essex—Residence.....		The Rev. T. W. Willis, Lanercost Vicarage, Brampton.....	"
Salford—School, Liverpool-street.....		G. Gardiner, Architect, Marine Parade, Clacton-on-Sea.....	"
		L. C. Evans, Town Clerk, Town Hall, Salford.....	"

THE BUILDING NEWS AND ENGINEERING JOURNAL.

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PROFESSIONAL QUESTIONS.

AT this time of the year, when many members of the profession are enjoying their holidays and recruiting their health and energies for another session, it is useful to "take stock," and review the position. One or two questions of pressing moment still occupy the attention of the profession. The educational problem is still with us, and seems as far off as ever from a satisfactory solution. The same problem concerns the engineering as well as the architectural profession. In both it is considered desirable that professional training should include a fair mixture of general education and workshop experience. The college system, in this country at least, has not been attended with the best results, one of the reasons being that our colleges have not the facilities for professional training which they possess in the United States, as the late Mr. Arthur Cates conclusively showed. On the other hand, the workshop system by itself is also not the best fitted to train engineers or architects in several branches. The two must be combined in some degree, and the question remains, Which is the most desirable mode? In an address delivered lately by Professor John Dewar Cormack, A.M.Inst.C.E., before the Engineering Conference held by the Institution of Civil Engineers, several combined systems were described in their relation to engineering. A youth entering a college after three years in the factory and office is said to be a good type of student. "He has gone through the shops at the receptive and initiative age." "He has ascertained whether engineering is to his liking, and comes to college with a knowledge of processes, materials, and machinery." But this class of student is often deficient in theoretical knowledge: he has probably forgotten his school studies, and his scientific knowledge of principles is too imperfect to be of any use in application. A youth who learns his business by workshop methods is often the least disposed to begin a college course. The other case given is one who has been to college, and is entering an office or workshop. The youth makes progress, though in the technical part of his business he is often at a loss to understand processes and machinery, and is unable to associate his theoretical studies with practical examples. The "college before works" student is certainly likely to acquire his workshop training more rapidly than the youth who has no preparatory knowledge. On the other hand, the college-trained youth does not take favourably to the shop drudgery. There are advantages and disadvantages in both the "separate" and "combined" systems; but the balance of opinion is in favour of compromises—one of these is where the pupil for a few months of each year spends his time in the office or factory or workshop, and the rest of the time in the college or classroom. The architect's training has not yet been definitely settled. There are those who prefer to keep the pupil at school or in classes, both before and after he is articulated; others who think that after his schooling is over he should confine his attention entirely to practical work. The workshop and college are antagonistic to each other. Youths take kindly to one or the other, as their inclinations prompt them. A few boys are studious; the majority are disinclined to study and book-learning, and the profession have to find out how these two opposite tendencies in the youthful mind can be made the best of or reconciled. A combined system

seems the only satisfactory solution. In the architectural profession we have the youth giving himself up to drawing and art and neglecting the practical side of his profession to provide for on one side, and on the other the youth that is practical and fond of manual work, but who cares little for art. Each of these classes has to be taken in account in the educational *régime*, though it appears we have only considered the youth who cares for study and books, or mere drawing, and have neglected a particular class that is the most numerous. These are points that deserve attention in the immediate future. During the vacation an opportune time will be given to consider the various questions which affect the profession.

We have lately referred to the Registration movement, which has made steady progress and enlisted the sympathies of not a few in the profession who at one time were its bitterest opponents. Architectural Competition Reform is another subject which may well occupy the spare moments of holiday-seekers who are obtaining rest, some of whom are interested in impending competitions. Many useful suggestions have been made since the Competition Reform Society was established. The results of recent competitions have left grievances in the minds of many. The principal objection to many of the decisions is that only one assessor of known tastes and prejudices has been appointed to judge the merits of the plans. The one-assessor system has not worked well in many cases, and a suggestion that there should be a jury of three assessors, two of whom should be architects and the other a specialist, has been favourably received. One suggestion is, that the conditions of competition should be drawn up by, or be approved by, the assessor, who should make his acceptance of the assessorship conditional upon his approving them, and that the conditions should form an agreement between the promoters, assessors, and competitors. The question whether the design placed first should be in strict accord with the instructions, or whether it should be in the opinion of the jury the best, is one that ought to be settled. The two things, compliance with conditions and skilful design, are not identical. If the conditions and instructions are made imperative, the awards should be based on them, though the promoters may reserve the right to carry out any other design they thought best, compensating fairly the author placed first. In the interest of the public at least this arrangement is justifiable. On the contrary, we are inclined to think imperfect and defective instructions drawn up by incompetent committees ought not to be made binding upon the author who has produced the most skilful design for the purpose. His design, at least, should receive a prize. In one or two instances of late the assessor has been bold enough to act upon his convictions in placing first a design which, though not in strict accordance with the letter of the instructions, is decidedly clever. Of course, such awards will always give offence to those who adhere closely to the instructions. The question is a moot one.

Among questions likely to form subjects of controversy in the next architectural session the Bill prepared last session to amend the Acts relating to buildings in London, and to confer powers on the London County Council, will receive early attention. The importance of the measure no one will question, in view of the serious losses of life owing to insufficient means of escape in case of fire from buildings. The vested interests of property owners in London have been strong enough to throw out the Bill; but there must be a renewed attempt to deal with the subject, and to amend the very inadequate provisions against fire in the London Building Act, 1894, especially in relation to existing high build-

ings. No doubt, many new suggestions will be made. The attitude of the profession towards the Bill is not yet known; but we cannot think it will be hostile to the main provisions. In fact, the profession will be gainers rather than losers if the owners of high buildings are called upon to submit plans to the Council for approval. A considerable reconstruction of business premises, warehouses, and dwellings must be the result. The construction of internal staircases and the approaches to buildings with projecting shops will involve considerable alterations and the amendment of section 74 of the present Act. The reform contemplated will also set the inventive faculties of many into operation. Means of escape have to be approved. In many buildings they must be on the outside in the form of balconies and flights of iron steps. The employment of concrete encased steel will be recognised, and those fire-resisting systems of floor-construction which are the most economical and effective will receive consideration. Of late the attention of the profession has been drawn to several instances of ferro-concrete construction, and the value of the Hennebique system, as shown in the tests of floors at Tottenham, we lately recorded. We expect to hear also many opinions expressed on the Ancient Lights Bill, lately discussed in these pages, now before Parliament. During the vacation the subject will not be absent from the minds of the profession. Now the text of the Bill is before the public, the clauses will be eagerly discussed. There is time to consider the results of the sections dealing with the limitation of the amount of light of a dominant owner, and how the limit is to be estimated in practice, and the best mode of calculating the obstruction. It will be objected by the dominant tenement owner that the clause will restrict his business, and prevent him from making a claim for obstructed light in certain cases. The amount of light "reasonably necessary for the comfortable use and enjoyment" of a dwelling-house is different to that which is necessary for a place of business or trade. Who is to decide how much light is necessary in each case?—also the extraordinary amount of light necessary for certain trades and occupations? Greater objection may be taken by some owners to the section which provides that obstruction of light by notice is to take the place of physical obstruction. The clause runs thus: "The owner of a tenement which is not at the time servient to another tenement, but over which such other tenement would in course of time become dominant, may serve on the occupier of, and upon any other persons whom he knows to be interested in the tenement which would become dominant, a notice called an 'Obstruction to Light Notice.'" The result of this notice is to render the access of light to the windows mentioned obstructed as if they were really and physically obstructed. The so-called dominant owner will think this notice an aggravating interference with his present rights, for the servient owner may effectually prevent his opposite neighbour from enlarging his premises. The provision, however, is a less objectionable form of procedure than an obstruction by boards. Subject to any relief which may be granted before the expiration of one year from the service thereof by a Court, the Obstruction to Light Notice will be equivalent to an interruption which has been acquiesced in for a year by the person so served. No doubt there will be defenders of the present barbarous system of physical obstruction who would rather submit to be blocked out when the time arrived. We, however, prefer the amended form; it is less harsh, and is a more business-like way of informing an adjoining owner that the servient owner has a right of light he wishes to maintain. No one can possibly find fault with the section which

provides that a servient owner who intends to erect a new or alter an old building is, at the request of the dominant owner, to give facilities to him or his surveyor to inspect the plans and elevations of any such building, or inform him of what is to be done. The provisions for certificated plans of buildings about to be taken down are also a reasonable way of allaying any ill feeling or difference that is likely to arise.

The Building By-laws in force are sometimes vexatious and exacting in their demands as applied to private buildings, and the question of reform has been discussed much of late, and will again demand attention. We lately referred to the efforts of the Building By-laws Reform Association, established last year with the object of securing that official control of private buildings shall not be extended beyond the demands of public health and safety. Individuals are at present often hampered by unreasonable by-laws. In the rural districts there has been fear of the encroachment of urban regulations which are quite unnecessary and troublesome, leading to much disagreement and litigation. In these and other places the by-laws should have reference only to the requirements of health and safety against fire, and not restrict the design of buildings in any undesirable manner. The Model By-laws issued by the Local Government Board are in general reasonable on this ground, and they omit many objectionable clauses which have been introduced into some of the rural districts. The effect of foisting urban by-laws on rural districts may be noticed in several of our country villages and seaside resorts, and the architectural tourist may very usefully compare notes during his rambles.

THE SELECTION OF MATERIALS.

AFTER the art of design, the selection of suitable materials, methods, and treatments is the most important duty of the architect; but the hurried and perfunctory manner in which this duty is often discharged is sufficient apology for the remarks we are about to make. The most usual mode is to specify certain goods and manufactures that the architect has chosen before for very different purposes or situations, or that have been recommended to him by clients or tradesmen, or which have a reputation on the market, without any inquiry as to their fitness or suitability in the circumstances. Another plan is to obtain from leading firms of tradesmen quotations of prices or catalogues, from which a selection is made. The average commercial practitioner who gets large commissions has little time and less capability or discrimination to consider the merits or defects of any manufacture. He passes over the trade catalogue to his client, or thinks this or that will answer, and the thing is done, or he simply leaves the choice to the contractor. Either of these courses is fatal to all good architecture, and to that sense of responsibility which the professional man should try to promote. There are many causes which have operated to divert the architect's attention from the details of his work—the growing multiplicity of trades, specialism, contracting, competition in prices; all of which things are more complex than they were some years ago. Division of labour or machine production has been, for instance, one main reason of the diversion of the architect's attention, of the want of interest he takes in selecting his own goods. So many materials and patterns are in the market that there is a greater task than formerly in making a choice. The price also enters into the question. Beyond this the architect's work has increased in complexity. He has more to think about than to make tests of bricks, stone, and steel beams, or to examine the patterns of a catalogue of iron grates or

chimney-pieces or decoration. Still, so long as he assumes the position of the architect, he has a responsibility in seeing that his design in its several parts and details is suitable and in good taste. It was a bad day for the profession when the architect relegated so much of his work to the trades, and only confined himself to the general design of the building. We are afraid it is very usual for the architect to limit his attention to the preparation of the contract drawings and specification and general superintendence, leaving all the fittings and decorative work to tradesmen. All continuity of motive and thought in the several branches of the design is thus lost. The coherence of the whole, the unity of design seen in the best work, is nowhere to be found. Selection implies a knowledge of the conditions, a preference of one material or mode of execution and treatment over another. Let us first consider materials in general. The very design of a building depends so largely on whether brick, stone, terracotta, or iron is to be employed, that we cannot conceive an elevation of a building that does not take into account this factor of selection, and yet we see designs for buildings which may just as well be executed in stucco as in brick. We all know the direct influence of material in all the old buildings, how the style was dictated by the local materials in every historic period, how the details of mouldings and decoration were influenced by the hardness of the granite, stone, or brick. Yet we have seen designs only suitable for stone carried out in brick, the architect changing the material to reduce cost at the last moment, as if the architecture was of the most accommodating nature. During the best ages the material always was first thought of; to-day the opposite course is followed: the drawings are first made, and then the architect proceeds to select the material which he thinks will be suitable. Or a mode of working the face is decided upon after the elevations of a stone building are prepared, instead of being made the motive of the design. A soft, easily-worked stone substituted for a hard limestone ought to make a difference in the treatment of design; so in wood, a design prepared for oak should be modified if pine or soft deal is used, and thus it may be shown that selection of material ought to precede the design in the mind of the architect: conversely, to make a design for any purpose and then to select the materials in which it is to be executed at random is an objectionable course to follow. But so it has been till lately. The style of a building has been thought of before the design and material. The happiest designs have been those that have been prepared in the locality of certain materials which are well known and worked by quarrymen and hands who have practised the trade from time immemorial; the least successful those which have been prepared in, say, a London office hundreds of miles away from the actual work, and for which the materials and modes of workmanship have been selected and specified without reference to the building or design, to suit exigencies and cost of carriage. A great deal may be said about the choice of materials and the adaptation of design to suit them. How much depends on hardness, facility of working and handling. The selection of stone, bricks, timber, or other ordinary materials may be a matter of mere cursory examination and preference, or be based on scientific inquiry. The architect, in his selection of bricks to bear any special stress, or to be used in piers, vaults, and other parts of a building, must depend on tests carried out in a systematic manner. On the Continent and in America such tests are conducted with precision, and are made the subjects of university and technical school teaching for the architect, as in the scientific schools of Harvard and Cornell Universities, &c. The cementing prop-

erties of cements must be determined by briquettes, and these must be made in properly constructed machines. Even the cementing power of rock-dust for road construction has to be tested. In selecting stone the architect ought to be acquainted with the properties of the particular kind he thinks of using, whether it is a sandstone or limestone. He may choose a stone for its colour or texture; but before he can safely employ it he ought to ascertain its crushing resistance and its durability in the atmosphere. For the purposes of piers and pillars the crushing strength is important, and he may for this reason select a sandstone which will have a resistance of between 500 and 700 tons per square foot. Some of these stones are hard and free working, and their absorption of water is important; others are untrustworthy. Perhaps the Derbyshire sandstones or "grits" are the most reliable: they weather well and carry a fine arris, and the colour is pleasing, as in the Darleydale varieties. Then the Mansfield red and white stones are often favoured by the architect, and some care is necessary to select a suitable texture, as a crystalline gritted stone, or one that can be easily worked and suitable for ornamental details or for dressings. If the architect is building in Yorkshire he has many admirable stones to choose from, such as Bramley Fall, Parkspring, Scotgate Ash, Robin Hood, Spinkwell, and Runcorn—all durable stones which weather and wear well, and of various shades of colour, from brown to blue. If he is selecting in the South or West of England, he has at his command a variety of limestones: Portland stone with 95 per cent. of pure carbonate of lime in its composition, quarried in three different beds, that are used for all architectural purposes, from the fossilised "roach bed," used for quay walls and breakwaters, to the fine crystalline "whit bed," suitable for the best buildings, and smooth in texture and of excellent weathering quality. Or he has in the West of England the free working oolite,—Bath stone in its many varieties, as in Box Ground, Combe Down, Corsham, Corngrit. Here also he has to be careful in making a selection, as these have all a resemblance to each other, and can only be distinguished by careful examination, as some of the Box varieties do not weather well, or are coarse; others are soft, and suitable only for internal use. He has to determine, therefore, first the physical qualities, the composition, resistance, weathering properties, texture, absorption, &c., and secondly those qualities of an artistic kind, like colour, before he can provide the stone suitable for his particular work. Knowledge of old buildings in which these stones are used is a valuable aid in selection. In the selection of timber the same general characteristics, physical and artistic, have to be considered. The latter properties come more into play in wood. The useful series of articles appearing in these pages on "Building Timbers" give the reader the means of determining which of the Memel or Riga firs and oaks are the best for particular purposes of building. As the writer points out, many terms are used that mislead. For instance, Memel or Riga "fir," when sawn into boards, becomes, in the trade phraseology, "deal," and the two terms are much confused in specifications, or are used indiscriminately for the same wood. Many architects, in specifying oak, fail to distinguish the qualities, for, as this writer says, "There are no less than two hundred varieties growing in the United States alone," besides the Canadian. A good deal of American oak has a twist very prejudicial to joinery. The best of it comes over in logs. "Wainscot oak" is often specified, but its meaning is not often understood in the trade. Some builders seem to think it is a kind of oak without any reference to its use. The writer of the articles we name very judiciously remarks: "The use of the term 'wainscot,' in describing oak, will assuredly lead some day to

one of those disputes lawyers are so fond of. For what is 'wainscot'? and what kind of oak is 'wainscot oak'? Wainscot is the panelled woodwork which is fixed against the walls of a room, and which covers these walls from the skirting to the ceiling cornice." But he goes on to say that in Hatton Garden and other parts of London the old houses are so wainscoted in the halls and best rooms; but the wood used is seldom other than pine—not from Canada, but Memel or Riga yellow, cut from logs called at the time "deal." Many mistakes have been made in the provision of timber and wood for joinery, but the subject is a difficult one. "Fir," "deal," and "battens" are specified of such and such a kind. There are set phrases used which mean almost anything. In the selection of hardwoods, for instance, for ornamental joinery, a flagrant mistake is noticed in the articles referred to. The chief object should be to exhibit the grain, and therefore it should be cut and selected specially with that object in view, whether in the framing or the panelling. The panel should, of course, be selected from the most ornamental parts of planks; the framing is better straight-grained and without "figure." The stiles and rails are the constructive parts, and ought to form a contrast to the panels, which should be cut from the figured portion of the wood. In a recent free library extension reference is made to a wall dado, 4ft. high, of pitch-pine. The woods used are painted or polished, and therefore the grain is hidden or accentuated. This writer says the joinery is rendered patchy by using woods of different shades of sapwood and heartwood, the effect of which is intensified in the varnished portion of the work. These mistakes of colour and grain are often seen in modern work; perhaps in a panel one half is highly figured, the other half plain, which, of course, renders the joint visible, where it ought not to be noticed. In work of this sort the way the wood is cut across the grain is important in the exhibition of "figure," for it may cut radially or tangentially. For varnished work, as this writer says, all the pieces for framing and panelling should be selected for the positions they are to occupy. As a matter of fact, the architect does not trouble about the matter. It is left to the contractor or his foreman of joiners, and the easiest convertible pieces or the readiest to hand are used. A clause in specifications for all ornamental joinery should provide that the architect should have submitted to him for his approval all hardwoods to be used in framed work, that the panels should be selected out of pieces with good "figure," and of even colour, and that at the joints (if any) special care should be taken to avoid any contrast of colour or grain in the pieces placed side by side; that all the rails and stiles are to be of approved wood, straight-grained, &c. In door framing especially the rule should be strictly observed. Unless a close supervision is exercised, deals are used that are not only unlike in quality, but of different shades, as cut from the heartwood or sapwood; unevenness of colour is also caused by the process of drying. But selection of timber and "deals" implies a general knowledge of the various kinds of wood used in building, the pine, red or yellow, and other varieties, the modes of conversion, of seasoning and drying. Very few in the profession can distinguish readily between Russian and the Norwegian and Swedish deals and battens; and the great variety of other woods that come from America and New Zealand require a special study. Canada red pine and America yellow pine are valuable woods for joinery, though of course not equal to that from the Baltic in strength. American oak is apt to be mistaken for English oak. Then there is not only pitch-pine, a red, tough, and durable wood more suited for varnishing than painting, but other kinds of

North American pine, like the Oregon, Quebec, and St. John's, Kaurie pine from New Zealand, and a large number of woods from Tasmania adapted for ornamental purposes, the special qualities, colour, and "figure" of which can be only acquired by experience. It is well for the architect to determine which of these several woods is best suited for any particular joinery. Many of them are well adapted for varnishing, others may be better painted. A good deal of the wood framing prepared for ordinary houses and buildings specified to be varnished is of so indifferent a kind that painting would be desirable.

In the choice of such things as fittings considerable judgment is called for. They should not only be convenient in position, but suitable for the purpose. The architect is directly concerned with the building fittings, especially those specified for business premises, such as inclosures of wood in banks and offices, counters, cases for goods, drapers' and chemists' fittings, the desks and seats in schools, library fittings, council chambers, and courts of law. The technical school and laboratory have special arrangements and fittings of benches and closets for physical and chemical experiments. Now, the selection implies a knowledge of the planning and use of these special fittings: how they are used to the best effect, the greatest ease of the sitter or student; if a desk or a bench, its economic construction, so that no waste of material, or unnecessary length, height, or width is allowed. Cases for books or other articles must in the same way be regulated in height, to save trouble in getting books, &c., from shelves, which should be of easy reach, and their position in the room has to be studied, that no area of floor be wasted, or an awkward corner left. In furniture selection the same rules ought to be observed; but this is generally left to the client and the furniture dealer.

To take another instance—decoration. It is at least curious that in the selection of methods and treatments so essentially artistic as those of wall and ceiling designs in plaster, Carton-pierre, Lincrusta, Anaglypta, and other substances, and also in the selection of wallpapers and colour schemes, requiring good taste, culture, and a keen sense of artistic discrimination and feeling, the client, or often his wife and lady friends have the matter in their own hands. As one writer remarks, for some reason or other difficult to explain, the decorator leaves the selection of wallpapers to his customer, who is in many cases absolutely incapable of choosing suitable designs. Yet so it is. The decorator, as Dr. Dresser said, can only explain his mode of action by assuming his ignorance of the art. Instead of suggesting to the client the kind of decoration suitable, he asks him how he wishes the room to be treated, whether he wants a dado or not, the kind of wallpaper, whether a plain or floral design, and the usual formula is, "I will send you a pattern-book to choose from." The same writer puts the pertinent question, What should we think of a medical man if he asked his patient how he should like the complaint treated, and what medicine he would prefer? We all know the truth of these remarks. Architects are not always blameless in this respect; they sometimes submit designs with similar confidence in their client's taste. The mistake is in supposing that decoration is governed by no other law than those of a capricious fancy. Though there is a little more common sense and caution exercised by decorative artists now, the client is too often the judge of what the design or the wall-paper should be. The tenant or owner visits the showrooms of a wall-paper dealer and makes a selection in the same way as he would in selecting the material for a garment. Without the slightest principle to guide him, he chooses a pattern that pleases in design or colour, without any

reference to the use of the room, its size, height, and lighting. The decorator is presumed at least to have a knowledge of the fundamental principles of art, and especially their application to his own work, but, alas! the competition in the trade quenches all desire to study the art or to instruct his customers. The decorator and the trades connected with him have to make a living, which supposes compliance with the wishes of their customers, a desire to please the popular taste. The architect at least can offer a protest to any bad choice, or persuade his client to adopt another design or pattern; but the tradesman is not in the same position. He sells his wallpapers, and it would be inimical to his trade to refuse his customer any design which he takes a fancy for. Of course, the customer's taste must be consulted; it is a factor in the solution, but not the only one. There are rules to be observed, based on physical and æsthetic laws. The selection of the pattern of a wallpaper or fibrous plaster decorations like those on the market ought to be ruled by the dimensions of the room, especially its height. If the room is large, a bold pattern may be suitable; if at the same time it is low, the design ought to be such as will give prominence to vertical features, that a vertical striped or panel design would do. But the design and colour of the paper should be controlled by other considerations. Chief amongst these are light and aspect. A south or south-east aspect will stand a more subdued tone of colour with advantage than a room with windows facing north or east. A badly-lighted room should have a light and cheerful paper; in fact, the light and aspect of room are the most important considerations in selecting wallpapers, though the rule is not generally observed. When pictures are to be hung in a room, the wallpaper should be a plain ground tone that will form a suitable background to the pictures. Any decided or bold pattern, or a florid design, would be absurdly out of place; yet how often we find pictures hung on walls covered with rich-coloured papers, which violently "quarrel" with the colours in the pictures? Then the use of a room, whether it is a dining-room, or study, or drawing-room, or bedroom, must be considered, and a paper chosen that will give pleasure or repose to the occupants. Decided and florid papers are, of course, utterly out of place in bedrooms or studies, though they may do well in dining and drawing rooms. These are simple rules to follow, but they are often wofully disobeyed. The wallpapers and decorations are specified to be of such-and-such value per piece or per yard, and no one takes the trouble about the design until the walls and ceilings are ready for them. A hasty selection is then made, perhaps, by the client and his wife, or the architect or builder; if they have no preference, they allow the decorator to make his own choice. We do not say this is the usual course when the architect is responsible, but it is common enough. An idea prevails that anything of a decorative character may be left to the "fancy" of someone who knows very little about it. The consequence is a waste of material and artistic effort. The picture frames, the carpets and ceilings, the upholstery and drapery, and furniture are all chosen without any rule of suitability or harmony, although they should have added materially to the architectural design and sense of completeness of the whole. We can hardly, indeed, think the architectural design of a building is seriously carried out when no attempt has been made to select proper materials and decorative adjuncts in agreement with the general intention and the rules of good art. We have only to look back at the old buildings and examples, or to the work of a few of our leading men, to see that this result can be attained.

THE TRADES' TRAINING SCHOOLS.

THE report of the judges on the work done at the Trades' Training Schools of the Worshipful Companies of Carpenters, Joiners, Painter Stainers, Plasterers, Tyllers and Bricklayers, and Wheelwrights, at 153, Great Titchfield-street, W., has just been published. The judging committee was composed as follows:—Messrs. John Willson, J.P., Master of the Worshipful Company of Carpenters (chairman); J. Hutton Freeman, Clerk to the Worshipful Company of Carpenters; Henry Phillips and T. Rider, Worshipful Company of Joiners; J. D. Craee, Hon. A.R.I.B.A., and M. C. Cowtan, Worshipful Company of Painter Stainers; W. Shepherd, Worshipful Company of Wheelwrights; George J. Newson and W. Grellier, Worshipful Company of Tyllers and Bricklayers; Aston Webb, R.A., P.R.I.B.A.; H. T. Hare, F.R.I.B.A., President of the Architectural Association; George Frampton, R.A.; Professor R. Elsey Smith, A.R.I.B.A.; Richard Parry, F.S.I., A.M.I.C.E.; S. Stevens Hellyer; and H. Phillips Fletcher, F.R.I.B.A., F.S.I., A.M.I.C.E., Director of the School.

The judges report that the work carried out in the Carpentry class continues to be of a progressive character—some of the exhibits showing a great amount of forethought and knowledge in their execution. The judges would, however, recommend that students in framing the principals of roofs, partitions, &c., should pencil on the face where straps, collars, ties, bolts, &c., are to be fixed. They would also recommend that in the case of all exhibits, when possible, it should be stated whether the student is responsible for the design or only the workmanship of the model, and in the latter case the source from which the design is taken. Albert Daley has been awarded for the third year in succession a special silver medal. Bronze Medals and £1 in books have been given to W. E. Sanders and E. J. Beasley, and a Bronze Medal and 10s. in books to B. Henbest. In the Joiners' class the judges express satisfaction at the improvement shown in the finished exhibits. A new feature this season is the air-tight eave. The Henry Phillips Silver Medal has been awarded to J. Vince, and Bronze Medals and £1 in books to F. J. Parker and W. King.

The judges regret to find that the work in the Masons' shop is most disappointing. They are accustomed to see some of the best work here, and the meagre display now shown does no credit to either the instructor or the students. Some of the unfinished work shows good promise. The Bronze Medal and £1 in books goes to G. Scrase.

The work of the Painters' class shows an improved attention to technical excellence in practical work. The specimens of writing, also, are executed more cleanly and with better finish than hitherto. The specimens of stencilling are not very satisfactory, either in the choice of design, in its application, or in the colouring. This seems partly due to the influence of poor designs published in trade journals, and often quite unfitted for good work. The first prizeman's work maintains a high average throughout. The second, who also has done well, has come from New Zealand to improve. First prize (Silver Medal) is given to Herbert Spencer Nott, and the second prize (Bronze Medal) to Edward John Bell.

The judges are glad to note the more healthy tone now prevailing in the Plasterers' class, and hope that even higher efforts will be made in the future. The Silver Medal is taken by B. George, and a special Silver Medal for modelling by W. Nellin.

As usual the Plumbing work is excellent, though the general standard is perhaps not quite so high as in some previous years. A special prize of £2 in books is awarded to F. J. Mitchell (former recipient of Silver Medal), a Silver Medal to John Cole, and a special Silver Medal for bossing to Charles Wildry.

The Smiths' class shows a very marked improvement, and the work done is most creditable. The judges would like to see more work finished, and think that shafting should be fitted to the drill, and, if possible, a screw-cutting lathe should be added. Bronze Medals are given to F. Bell, J. Hartnell, S. Brooker, and J. Pugh.

The work exhibited in the Stone-carvers' class is far in advance of any previous work, and the judges are glad to find that such good use is made of the excellent studios. The proposed addition of a life class will no doubt still increase the usefulness of this class. A special

prize of £2 in books goes to W. R. Jones (a former recipient of Silver Medal), Silver Medal and £1 in books to J. W. Hanchet, and a Silver Medal to A. Bowler. A Bronze Medal and £1 in books to M. Borchardt, a Bronze Medal to W. Wilson, and a Bronze Medal for modelling to E. Forrester.

The Tyllers' and Bricklayers' class has now advanced to the front rank, and the works exhibited are more numerous and show greater skill than in former years. The judges are glad to be able to award to Charles Fry the Banister Fletcher Medal, as being the best craftsman in the schools. A Bronze Medal is given to W. Domini, and £1 in books to W. Flaherty (a former recipient of Bronze Medal), the two students being bracketed equal. A Bronze Medal is also given to G. T. Crabb.

In the Wheelwrights' class the attendances during the session have been quite up to the average. The exhibits are as numerous and meritorious as in previous years, and show great care and attention to the instructions given. First prize is awarded to W. R. Crookford, and the second prize to W. F. Willment; a special prize, given by the master of the Wheelwrights' Company for drawings, to A. A. Gilderson.

The judges regret to see the poor number of exhibits in Mr. Horsey's class of Wood-carvers. The works shown by Mr. Moutries' pupils are as numerous as usual, and are on the whole fairly creditable. In the latter class the Bronze Medal is given to T. H. Groves, and the second Bronze Medal for modelling to F. Pennelli. In Mr. Horsey's class the Bronze Medal is taken by J. Coxell.

PLANNING AND FITTING-UP OF LABORATORIES.*

THE design and building of schools of technology has so rapidly extended, that any work which deals with the details and fitting-up of such buildings must be of value to the architect. Except the work of the late Mr. E. C. Robins on "Technical School and College Building," published nearly twenty years ago, and therefore rather out of date, we do not remember any English treatise on the subject. Mr. T. H. Russell, M.A., who has had much experience in working out the details of fittings for the chemical department at the Manchester Municipal Technical School, has now brought out a volume on the "Planning and Fitting-up of Chemical and Physical Laboratories," which deals comprehensively with the subject. The work is illustrated with 36 plans and drawings of laboratories, details of fittings, &c., and will be found useful to architects, in preparing their working drawings of lecture-rooms and laboratories. The illustrations give plans, perspective views, elevations, and sections of benches, draught closets, sinks, shelves, lecture tables, &c. The development of technical education has increased immensely the requirements of schools, and many of the earlier schools of this class have had to be remodelled, and their fittings superseded by newer ones. No scientific institution is so varied in its requirements, and the complexity of the fittings and apparatus required increases with the number of students. Mr. Russell first indicates, by plans, the arrangement of the fittings of a room for elementary teaching. One of these shows a table and three benches placed parallel to each other at distances of about 2ft. 9in. or 3ft. in the centre of the room. The length of bench space allowed to each pair of children would be about 2ft. 6in. or 3ft., the benches are about 2ft. 4in. wide, 2ft. 8in. high, made of deal, treated with paraffin. The room measures by scale about 26ft. by 24ft., or nearly square, lighted on one side. A draught closet is at one corner, and a cupboard at another, with blackboard on the wall between. Near is a sink, and sinks are placed along one of the sides of room and a balance-shelf on the opposite side. The demonstration table is about 14ft. by 2ft. wide. Ordinary classrooms are often fitted up for practical work, fixed benches cannot be used, and wall-benches are found useful. These are, in fact, cupboards containing shelves against the walls projecting about 8in. or 9in., with hinged doors beneath the bench tops, which are 2ft. wide. Two types with fold-up top are illustrated. A sink is placed at the corner of room. The doors open from the working bench, which can be supported on folding brackets. Another

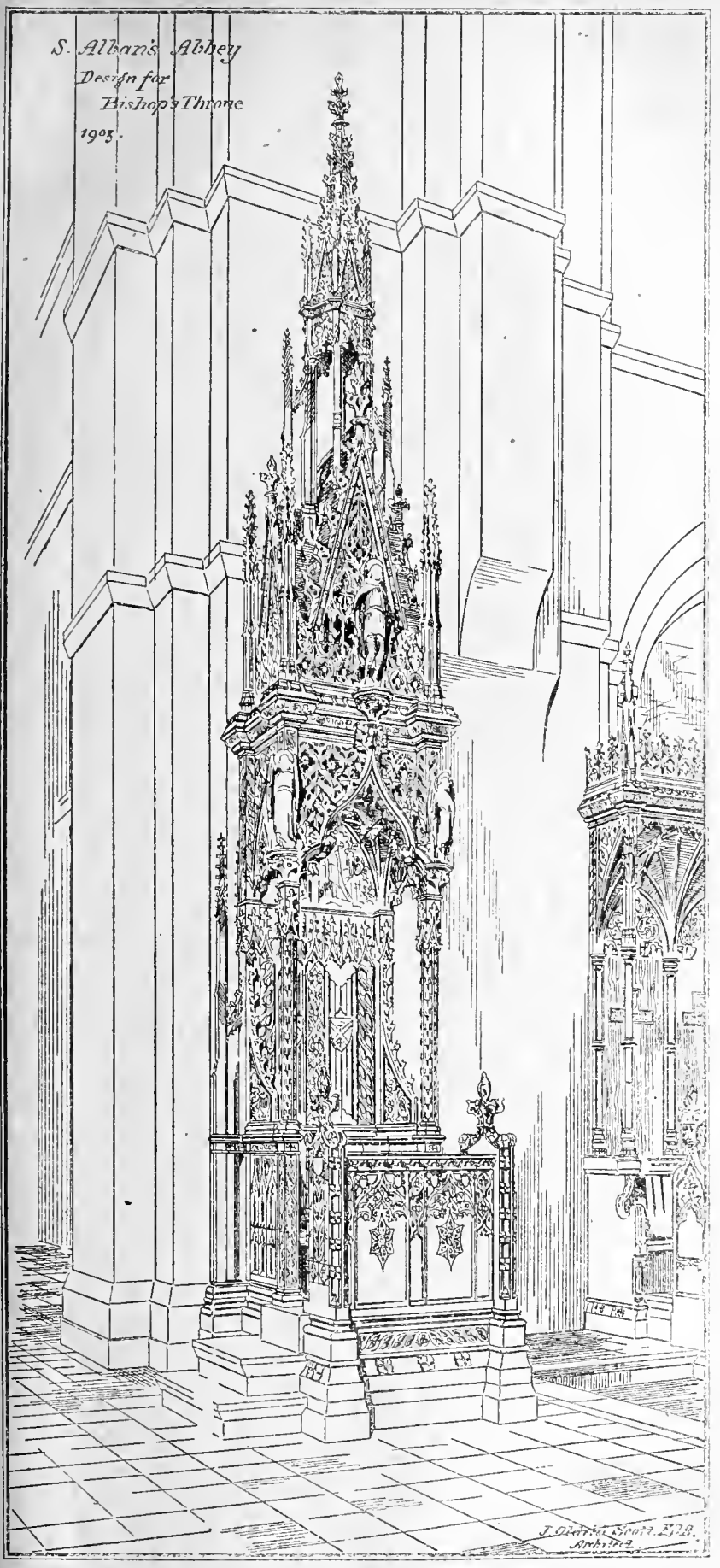
plan shows separate chemical and physical laboratories with one lecture-room suitable for a small school. These plans are drawn to scale, and show convenient arrangements. The physical laboratory has three tables in centre of room, blackboard, and cupboards and sink, with inclosure for balances at one end. The Birchfield-road, Liverpool, school is of this character, a plan of which is given; the laboratories are separated, and form right-angle blocks, with lecture-room between. Part II. deals in more detail with chemical laboratories. The author says: "When the chemical department occupies only a portion of a building, it should be either on the top floor or disconnected from the rest of the building by a lobby or corridor through which a current of fresh air is always passing. The object of this arrangement is to intercept any fumes that may escape from the laboratory." Besides the lecture room, which may be separate or combined, smaller rooms are required for balances, combustion work, lecture preparation, and stores. An advanced laboratory and a teacher's room should also be provided. The main laboratory is fully described; it should be large and well lighted and ventilated. Top-lights and side windows are desirable if possible. A height of 14ft. is given as the least height. The author says a "ridge and furrow" roof, with the glass slopes inclined at an angle of 60° and facing north and east, is an excellent arrangement. Every part of the laboratory is fully described. The ideal arrangement is that in which the convenience of the workers is consulted, that they can carry out their experiments with the minimum amount of moving about; but opinions differ about the fitting-up of laboratories. The main fittings, working benches, sinks, and draught closets are fully illustrated and described. The bench may be the single or the double back-to-back bench, a perspective of which is given. The following several arrangements for benches are noticed:—(a) Single benches across the room like the desks of a classroom with side gangways; (b) single benches round the room against the walls; (c) single benches against the long walls and a double bench (or benches) down the middle of room; (d) double benches lengthways, down the room, or (e) double benches across the room with side gangways. These different arrangements are found in certain schools; (a) is proposed to be adopted in the County Technical Laboratories at Chelmsford, and it is also the best for elementary science rooms. Method (b) is not desirable: method (c) is adopted at Battersea Grammar School and numerous other laboratories; method (e) is followed at the East London Technical College, Chelsea Polytechnic, &c. For a given plan of laboratory, the allowance for bench space per student can only be determined by plotting the benches and gangways. The author allows 30sq.ft. to 36sq.ft. of floor area per student, including gangways. For quantitative and organic analysis more space is necessary than for students doing qualitative analysis. The length of bench-space per student is about 3ft. 6in. to 4ft. The dimensions of double benches, which vary in width, from 4ft. 6in. to 5ft. and other dimensions are given. And there are illustrations given of demonstration tables, double working-benches, draught closets, &c., but into these details we cannot enter. Illustrations follow of fittings and apparatus—such as evaporation-closets for various cases, and the sizes of each fitting. Physical laboratories form a third part of the book, in which the rooms, their dimensions and the space required, and the fittings are very fully dealt with. The last part, on ventilation and warming and lighting, will be found of interest. The value of Mr. Russell's book to the architect of technical schools and laboratories is that the arrangement of the plan, the pattern and size of each fitting, allowance of space per student, are given in a concise and portable form.

ST. ALBAN'S THRONE.

THE new choir-stalls for St. Alban's Cathedral were designed by Mr. J. Oldrid Scott several years since. As originally drawn, they had an upper range of tracery rising some four feet above the canopies; but this was disallowed by Lord Grimthorpe. At this time only the return stalls, with their canopies, &c., were carried out. It was decided a few months since that the completion of the stalls with a new throne should form the memorial to Bishop Festing, and the tender sent in by Mr. Bridgeman, of Lichfield, was accepted. The stalls will cost about £2,500,

* The Planning and Fitting-up of Chemical and Physical Laboratories. By T. H. RUSSELL, M.A. London: B. T. Batsford, High Holborn.

*S. Alban's Abbey
Design for
Bishop's Throne
1903.*



and the throne about £600. The latter was designed by Mr. Scott lately, and the whole work now well in hand, and is to be dedicated on St. Alban's Day next year. The choir at present terribly disfigured by the massive organ with a Norman case. It stands most conspicuously in the ancient stone screen just west of the stalls.

It is hoped, however, that means may be forthcoming at an early date for rearranging the organ and supplying new cases of suitable design.

On Monday the electric cars from Dewsbury to Cleckheaton, by way of Heckmondwike and Liverpool, commenced to carry passengers.

UNIVERSITY COLLEGE, LONDON.

NEW DAY SCHOOL OF ARCHITECTURE.

THE inaugural lecture (Subject: Architectural Evolution) of the New Day School of Architecture will be delivered by Professor Simpson on Wednesday, October 7, at 5 p.m., when the chair will be taken by Mr. Aston Webb, R.A. elect., President of the Royal Institute of British Architects.

The session is divided into three terms, as follows, all the dates being inclusive:—First term, from Tuesday, October 6, till Friday, December 18. Second term, from Tuesday, January 12, till Friday, March 25. Third term, from Tuesday, April 19, till Saturday, June 18, for lectures. Class examinations will begin on Monday, June 20. Class-lists and awards of prizes and of scholarships will be announced on or about Tuesday, July 5, when the session ends.

The Principal and Professor Simpson will attend from 10 a.m. to 1 p.m. on Monday, October 5, and Tuesday, October 6, for the purpose of giving advice and information to students entering the college. The matriculation examination, which students are strongly advised to pass before beginning the course, begins on Tuesday, September 22. Applications for admission must be made to the secretary on or before September 8.

Systematic day courses for architectural students will be started in October. Students who have already had some experience can join any of the lectures or classes by the year or by the term, but the principal course extends over three years, and at the end of it the college certificate can be obtained. This course is intended primarily for students who wish to become architects, and should be taken by them before they enter an architect's office. The need for such a preliminary training cannot be insisted upon too strongly, although it will still be necessary for students who have taken the course to spend some time in an office before commencing practice. A pupil who goes straight from school into an office generally wastes the greater part of his first year or two, because much of the work he is set to do is unintelligible to him. Even what he does understand, he picks up in a disjointed manner, and often remains in ignorance of the most elementary facts.

The advantages of a preliminary course are briefly these:—(1) The training is systematic and continuous; (2) all details of construction, some of which in an office are often omitted because they are taken for granted by both architect and builder, are fully worked out and explained; (3) the student has to think for himself from the first, and not merely to interpret the thoughts of others, and yet he receives far more personal supervision than can ever be given by a busy architect in practice; (4) the saving of time is considerable, as none is wasted over drawings and tracings which the student does not understand; (5) it tests his fitness for the work, and weeds out the unfit. No articles are signed which bind him to a term of pupilage. At the end of the first year he is free to go or to remain.

The advantages to the architect are as great as to the student. It is true that with a pupil thus trained he receives a smaller premium, and that the term of pupilage is shortened; but instead of a raw youth to whom the most elementary detail has to be explained, he has a trained student who from the first should be of some assistance.

The architectural course at University College is framed, in the first place, to provide a systematic training in the practical and aesthetic sides of architecture, and in subjects closely allied to it; and, in the second, to encourage students to continue their general education, and so bring them into touch with other students in other departments, who are pursuing different courses of study. The college already possesses in its Slade school of fine arts, its large engineering laboratories, and its comprehensive arts and sciences classes, valuable aids to a school of architecture. Advantage will be taken of these, so far as is possible, having regard to the limited time at the student's disposal, so that the course should not be entirely on technical lines, but on liberal lines also.

To further this, stress is laid on the necessity for a thorough grounding in the history of architectural development. The planning, construction, and general principles of the masterpieces of ancient and modern times will be explained. The aim of the lectures on Architectural History will not be to cram a student's brain with names, dates, and dimensions, but to enlarge his mind,

stimulate his imagination, and interest him in his art.

A special course will be provided for architectural students by the Professor of Mechanical Engineering in steel and iron construction, and in the testing of materials.

THE THREE YEARS' CERTIFICATE COURSE.

The College certificate will be granted to students who have passed the Special Matriculation Examination or some other examination (such as the London University Matriculation) accepted in lieu of it, have presented certificates of attendance in three of the subjects mentioned below under "first year," and have satisfactorily passed through the full architectural course.

Students who have taken their B.A. degree at any university are exempted from the matriculation examination and from the general subject mentioned under (a) in the first year, and can obtain the College certificate at the end of two years instead of three.

The composition fees payable are 45 guineas for the first and 35 guineas for each of the two following years. These admit to all the lectures and classes of the course.

The Donaldson Silver Medals are awarded to the two most successful students at the end of the course.

MATRICULATION EXAMINATION REGULATIONS.

1. The examinations for this certificate are held twice each year, beginning on the second Tuesday in May and the fourth Tuesday in September.

2. The fee payable is one guinea. Should a candidate fail, he will be readmitted on payment of half a guinea.

3. Candidates must give notice of their intention to enter for the examination not later than fourteen days before the date of the commencement of the examination.

4. The fee must be paid at the office of the College, and an entry-form obtained by each candidate before he can be admitted to an examination.

5. Candidates must pass in—

(1) English: one paper, three hours;
(2) Mathematics: two papers of three hours each; and in two of the following subjects, one only of which may be a modern language, one paper of three hours in each subject:—

(3) and (4) Latin, Greek, French, German, Italian, Spanish (or any other modern language may be accepted if two months' notice is given by the candidate); Elementary Physics, Elementary Chemistry, Architectural and Free-hand Drawing, Elementary Mechanics.

SYLLABUSES.

English.—A general paper comprising questions in Geography, History, and Literature.

Mathematics.—Ordinary rules of Arithmetic; Approximate Calculations; use of Logarithmic Tables; Mensuration of Areas and Volumes; Algebra, including the Binomial Theorem; Euclid, Books I. to IV. and Book VI. Props. 1 to 7; Trigonometry, including the Solution of Triangles.

Languages.—Translation, Prose Composition, and Grammar.

Elementary Physics.—Elementary Heat, Light, Electricity and Magnetism.

Elementary Chemistry.—Including the Principal Properties of Matter, the Laws of Chemical Affinity, Atomic Weights, Valency, and the Chemistry of the Principal Inorganic Elements.

Architectural and Free-hand Drawing.—Drawings to scale and from the cast.

Elementary Mechanics.—Velocity, Acceleration, Laws of Motion, Mass, Force, Work, Energy, Rectilinear Motion, Composition and Resolution of Forces, Elementary Hydrostatics.

First Year:—

(a) Three of the following:—

History (Ancient or Modern). English Y. French Y. German Y. Mathematics Y. Chemistry Y. 1. Elementary Mechanics Y. 1. Junior Graphics Y. 1.

The above are the lectures and classes for students who have already passed or have been exempted from the Matriculation Examination. Other students will have special courses arranged for them.

(b) Drawing from the Antique, two half-days a week.
(c) Building Construction.
(d) History of Architectural Development.

Second Year:—

(a) Engineering Class Special Course, 1st and 2nd Terms.

A Course will be delivered by the Professor of Mechanical Engineering dealing with iron and steel construction in buildings (roofs, girders, stanchions, &c.), and laboratory tests on cement, bricks, stones, concrete, timber, iron, steel, &c.

(b) Drawing from Antique or Life, two half-days.
(c) Perspective.
(d) Building Construction.
(e) History of Architectural Development.
(f) Surveying Z. 2.

In their Second or Third Year students should attend the evening lectures on Quantity Surveying.

Third Year:—

(a) Hygiene Z. 1.
(b) Modelling, two half-days a week; or Life-Drawing, two half-days a week.
(c) Architectural Planning and Design (see below).
(d) History of Architectural Development (see below).

Third Year Students might with advantage attend the lectures on Greek and Egyptian Art.

Students who receive special permission will be allowed to work in the classes of the Trades' Training School, Great Titchfield-street, during their second and third years.

A.—BUILDING CONSTRUCTION AND DESIGN.

First Year.—Lecture. Wednesday, 11 to 12.
Brickwork, masonry, concrete, mortar; carpentry, lating, tiling, external plumbing; simple iron roofs, concrete floors; stone and concrete stairs and the materials.

Studio Work.—Exercises are set bearing on the subjects lectured upon.

Note.—This Session the lectures will not be given until after Christmas, as the new premises will not be open until then. Students will devote extra time to Drawing from the Antique.

Second Year.—Lecture. Tuesday, 10 to 11.
Soils, foundations, hollow walls, joinery, plastering, internal plumbing, pointing, glazing, drainage, shoring, underpinning, and the materials.

Studio Work.—Exercises as above.

Third Year.—Lecture. Wednesday, 10 to 11.
The planning and designing of simple buildings, which includes further exercises in the different trades previously lectured upon. Designs will be worked out and detail drawings made. Specifications, &c.

The lectures will be delivered when necessary, and will deal with the requirements and chief points which have to be observed in each subject.

Visits will be paid from time to time to buildings in course of erection, workshops, &c.

B.—HISTORY OF ARCHITECTURAL DEVELOPMENT.

First Year.—Lecture. Friday, 11 to 12.
(Third Term only).—Greek and Roman mouldings and ornamentation; Greek buildings, their plans and characteristics.

Studio Work.—The Greek and Roman orders.

Visits will be paid to the British Museum.

Second Year.—Lecture. Friday, 10 to 11.
Roman buildings; their plans, materials, and construction. Early Christian and Byzantine Architecture in the East and in Italy. Romanesque Architecture in Italy, France, England, Germany, &c.; introduction to Medieval (Gothic) Architecture; the development of groining, &c.

Studio Work.—The plans, detail, and construction of the above.

Third Year.—Lecture. Tuesday, 11 to 12.
Medieval (Gothic) Architecture in England, France, Germany, and Italy. The Architecture of the Renaissance in Italy, France, England, Germany, Spain, &c.

Studio Work.—Sketching plans, details, &c.

In the second and third years visits will be paid to buildings of interest in and near London, which are examples of the different periods lectured upon.

STUDENTS NOT TAKING THE CERTIFICATE COURSE.

Students not wishing to go through the Certificate Course can take merely the Architectural and Drawing from the Antique Classes, devoting the whole of their time to these.

For 30 guineas for any one year, or 12 guineas a term. Students can attend the History of Architectural Development Lectures without joining a Studio Class.

For any one course, £5 8s. a year, £2 2s. a term.

Students cannot attend the Building Construction lectures without joining a Studio Class.

Fees for any one Course of Lectures: Building Construction, or History, and 1 day a week Studio, £10 10s. a year, £4 4s. a term; ditto and 2 days a week Studio, £14 14s. a year, £5 15s. 6d. a term; ditto and 3 days a week Studio, £18 18s. a year, £7 7s. a term.

WORKING DRAWINGS, BUILDING CONSTRUCTION, AND MEASURING AND ESTIMATING.

Professor, F. M. Simpson, F.R.I.B.A.; Instructor in Measuring, E. J. Burr; Demonstrator, A. Bachman.

For fuller particulars, consult the separate programme of these Classes.

The Carpenters' Company being desirous of extending the instruction in the above subjects, the following Evening Classes (the expense of which is borne by the Company) at very moderate fees will be held under the direction of the Professor of Architecture.

These Classes are free to Students entering for any of the Courses named above.

C.—EVENING CLASS FOR CONSTRUCTION AND WORKING DRAWINGS.

Two Evening Classes for the study and drawing of Building Construction—one elementary and one advanced—will meet on Thursday evenings in the First and Second Terms—viz., Elementary from 6.45 to 8; Advanced from 8 to 9.15. A Lecture will be given by the Demonstrator each week.

Instruction in Drawing will be given by the Demonstrator, and the principal subject of the examination in Building Construction held by the Education Department will be taken up.

Professor Simpson will deliver two or three lectures during the Session on Designing in Material.

Fees.—For either Class for a Term, 10s. 6d.; for the Session, £1 1s.

D.—EVENING CLASS FOR MEASURING, QUANTITIES, AND ESTIMATES.

Two Evening Classes—one Elementary and the other Advanced—for the study of Measuring, taking off and preparing Quantities, and the principles of Estimating, will be held, during the First and Second Terms, under the direction of Mr. E. J. Burr. The system followed is that of Mr. Rickman.

Elementary on Tuesdays from 6.30 to 7.45.

Advanced on Fridays from 6.30 to 7.45.

Fees.—For either class for the Session, 10s. 6d.

Students will be permitted (under proper regulations)

to use books from the Technical Library of the Carpenters' Company.

N.B.—Students obtaining a nomination from the Carpenters' Company will be admitted either to the Lectures or the Evening Classes at half-fees. Applications should be addressed to the Clerk of the Company, Carpenters' Hall, E.C.

FERROUS SULPHATE AS A COAGULANT IN THE MECHANICAL FILTRATION OF WATER.

By ERNEST E. IRONS, Bacteriologist.

IT is well known that a number of chemicals, including some of the salts of iron, when introduced into water containing carbonates, are decomposed with the formation of a more or less gelatinous coagulum, the reaction being analogous to that which occurs when alum is added to water. However, in the case of iron salts the presence of the carbonic acid liberated in the reaction renders a small portion of the iron hydrate soluble, and it hence passes through the filters in amounts which are inadmissible in a water to be used for domestic purposes. The system now used at Quincy aims to obviate this difficulty by the neutralisation of the carbon dioxide by the addition of a suitable amount of lime water. A certain proportion of the precipitated iron is oxidised to the ferric state. In addition to the carbon dioxide set free in the reaction, the river water normally contains a certain amount in solution, which must also be neutralised by the lime water. Both iron and lime have been used separately in a number of processes for the purification of water and also together in the chemical precipitation of sewage (Massachusetts Board of Health reports), but so far as can be learned they have not been employed hitherto in the same manner as at Quincy in the purification of drinking water. The system was installed in July, 1902, and has been in continuous operation since that time. It consists of the addition to the raw water of solutions of ferrous sulphate and lime water in the proper proportions, with resulting coagulation, followed by rapid subsidence in a specially constructed basin and filtration through Jewell mechanical filters.

The plant consists of a house on the river bank containing pumps, two 7,000-gallon tanks for the lime solution, and one 3,700-gallon tank for the iron solution, a sedimentation basin and filter house on the side hill above, and a storage reservoir on the heights some two miles distant. The Mississippi River water flows into an in-take well, is raised by a low-pressure pump to the basin, flows back by gravity to the filter house, and passes through the filters to the high-pressure pump, which forces it to the reservoir. The iron solution enters through the suction of the raw water pump, and the lime-water is introduced after the passage of the raw water through the pump. The water, charged with the solutions, passes to the sedimentation basin, 70ft. by 70ft. and 9ft. deep, divided into four compartments, and around the compartments under and over top and bottom baffles. In this passage through the basin, which requires one and a half hours, the water undergoes considerable clarification, so that at the outlet, where it weirs over into a shallow steel trough, it contains only a small fraction of the suspended matter contained at the inlet.

In September, 1902, a series of experiments were instituted to determine the several factors involved in the process, and its efficiency and cost. The experiments were renewed during the period December to February, and again in the latter part of March. Bacteriological and chemical analyses of the water from the intake, the inlet and outlet of the basin, the several filters, and from the effluent of the high-pressure pump, were made at intervals daily, together with observations on the relation of the suspended matter in the river water to the coagulation and clarification in the basin, with varying quantities of coagulant.

The carbon dioxide in the raw and filtered water, determined by titration with sodium carbonate, was found to vary somewhat from day to day, and was subject to occasional larger fluctuations which could not be correlated with other changes in height of water, rain, temperature, &c., so far as these could be determined. The quantity varied from 5 to 22 parts per million during the period of observation.

In September the number of bacteria in the river water as determined by the plate method averaged about 35,000 per cubic centimetre. Later, during December and the early part of

TABLE I.—FINAL RUN, MARCH 24-27, 19 3.

Date.	Turbidity.	Suspended Matter p.p.m.	Bacteria per c.c. raw water.	Grains per Gallon.		Cost per Million Gallons.			P.C. Wash Water.	Hours Service of Filters.	Average Effi- ciency of		Efficiency of Basin.	CO ₂ .	Alkalinity of Water p.p.m. CaCO ₃		Iron p.p.m. FeO		Stage of River.
				FeSO ₄ .	CaO.	Iron.	Lime.	Total.			Filters.	Plant.			Raw.	Filtered.	Raw.	Filtered.	
March 24.....	300	—	80,200	3.13	1.22	1.79	.59	2.38	4.7	22	99.3	99.3	91.0	6.55	135	123	.43	.05	10'—11"
March 25.....	300	—	87,200	3.13	1.12	1.79	.52	2.31	5.6	22	99.1	99.1	97.9	6.25	136	121	.50	.05	11'—00"
March 26.....	250	230.4	83,500	3.01	1.21	1.73	.58	2.30	5.5	20.4	99.5	99.4	95.6	6.12	135	121	.50	.08	11'—00"
March 27.....	181	—	47,700	3.12	1.22	1.78	.60	2.38	4.7	23.8	99.4	99.3	95.7	6.40	137	125	.50	.02	11'—01"
Average ...	258	—	74,600	3.10	1.19	1.77	.57	2.34	5.1	22.05	99.3	99.3	95.8	6.33	136	123	.48	.05	—

January, the numbers were somewhat lower (25,000 to 35,000 per c.c.), rising considerably in the latter part of January and early February (50,000 to 100,000 per c.c.). During the latter part of March the numbers averaged about 80,000 per c.c. Some observations on the occurrence of *Bacillus coli communis* in the river water serve to further indicate the degree of pollution of the Mississippi River by sewage.

In October, during the preliminary tests, the temperature of the river water varied from 16° to 20° Centigrade. During most of the winter period the temperature was slightly above the freezing point, rising during the latter part of March to 7° Centigrade. In passing through the surface condenser of the raw-water pump, the temperature of the water is raised about 1° Centigrade. The slight seasonal variations in temperature appear to play an insignificant part in the reactions taking place during the process of purification.

It is manifestly impossible here to more than outline the results obtained with sulphate of iron at Quincy. The principal points of interest are those relating to the qualities of iron and lime required in the process, the method of application, the part played by the sedimentation basin, and the bacterial efficiency obtained.

The lime water is made by slaking lime in a hopper placed above the lime-solution tanks. It has been found that lime of the quality obtainable at Quincy gives one grain of calcium oxide for every 1.43gr. of commercial lime. This ratio varied from day to day with the "fatness" of the lime, so that the cost of lime for each day's run is not always proportionate to the grains of calcium oxide used per gallon of water treated. The amount of lime-water to be applied to river-water varies with the amount of CO₂ in the river-water, and with the amount of sulphate of iron added. Some recent studies seem to indicate that rather more lime has been used in obtaining good results in practice than is theoretically required. This may be accounted for partly by minor reactions in the water, and partly by unavoidable error in the estimation of the CO₂ by the method employed.

The sulphate of iron crystals are dissolved in water in the proportion of 4oz. of sulphate of iron to one gallon of water, and the solution added at a fixed rate to the river-water. Owing to certain difficulties with the filters, which have since been remedied, accurate data regarding the efficiencies which may be obtained by using varying amounts of the coagulant could not be obtained. However, in treating relatively clear waters (turbidity 10-20) in which a high degree of pollution was present (e.g., 100,000 per c.c.), it was found that the efficiency of the plant could be materially raised by increasing the iron from 1.5gr. per gallon to 2gr. or 3gr. per gallon. When this was done, the coagulum was correspondingly greater in amount, and while tending to settle somewhat more rapidly in the basin, gave as well a greater efficiency for the filters computed on the basis of the character of the settled water reaching them. With high turbidities (500-1,500) it has been found desirable to use more of the coagulants; but even with the highest turbidity noted during March (1,500), the average iron required was 3.70gr. per gallon. This is more significant when taken in connection with cost of operation.

The estimation of the quantity of iron used is based on the quantity of the above solution added to the water, and the figures refer to grains of ferrous sulphate crystals (FeSO₄ 7 H₂O) per gallon of river water, assuming the iron solution to be of full strength (1,750 grains per gallon). The quantity of lime water used is based on the quantity pumped from the lime tanks, the strength of each of which was determined by titration. The amounts used are computed in

grains of calcium oxide (CaO) per gallon of river water.

As an example of the determinations made daily, the results obtained in the final run are given in Table I. These results are confirmatory of earlier tests made in September, 1902.

It should be noted that in this run with turbid water, the high efficiency of the basin (95.8) would have rendered a good efficiency possible even though the filters had been in a lower state of efficiency. The determination of iron in the river water was made on samples without filtering through paper, and hence represents an amount of iron far in excess of that actually dissolved in the water. On the other hand, filtration through paper failed to remove the finest portions of suspended matter, so that a determination of the iron in such a sample would represent neither the total nor the dissolved iron. The filtered water (average of four days, 10 samples per day) contained .05 parts per million of iron (FeO). Iron in this quantity in water has no practical significance.

Perhaps the most striking feature of the above table is the high degree of purification obtained in the passage through the basin. The employment of a coagulant of relatively high specific gravity favours sedimentation, and this, combined with the use of the basin for rapid settling, obviates to a large degree the difficulty of treating highly turbid water, by utilising the suspended matter to hasten sedimentation and purification. The figures giving the per cent. of wash-water are somewhat misleading, inasmuch as approximately 17.5 vertical feet of wash-water are used at a washing, whereas in newer types of filters from 5 to 6 vertical feet are required. The high efficiency of this and the fall runs was not maintained throughout the entire winter period; but, judging from the data obtained, it is believed that under conditions entirely realisable in a suitable plant, results as good as those of the fall and spring runs may reasonably be expected.

Table II. shows the cost of coagulants at Quincy for the first nine months, July, 1902, to March, 1903.

TABLE II.—COST OF QUINCY PROCESS, JULY, 1902, TO MARCH, 1903.

Month.	Aver. Turbidity.	Pounds per million gallons.		Grains per gallon.		Cost per million gallons.			CO ₂ p.p.m.
		Iron.	Lime.	Iron.	Lime.	Iron.	Lime.	Total	
July	—	314	232	2.20	1.29	1.25	.54	1.83	—
Aug.	—	213	214	1.49	1.54	.85	.70	1.55	—
Sept.	—	213	214	1.49	1.54	.85	.70	1.55	—
Oct.	173	241	313	1.69	1.59	.93	.70	1.66	—
Nov.	91	241	289	1.76	1.41	1.00	.65	1.65	—
Dec.	57	343	332	1.68	1.63	1.37	.74	2.11	—
Jan.	15	271	313	1.40	1.53	1.08	.78	1.86	14.4
Feb.	59	321	251	2.29	1.23	1.28	.63	1.91	10.41
Mar.	579	451	262	3.15	1.31	1.84	.68	2.46	10.30
Av.	—	291	294	1.96	1.45	1.16	.68	1.84	11.58

During July and August the river was turbid. The average of three analyses made during July and August gave suspended matter 305 parts per million. This is probably somewhat below the actual average, as the summer of 1902 was remarkable for its heavy rains and high stage of the river. The average cost per million gallons for the five months ending December 1 was 1.65dol. These costs are computed on the basis of sulphate of iron at 40 cents per cwt., and lime at 22.5 cents per cwt. up to January 1, 1903, when the price rose to 25 cents per cwt. With reference to the bacterial efficiency obtained throughout this period, no data are at hand except those of run No. 1 (September 29 to October 4), during which an average efficiency of 99.0 per cent. was obtained for the filters. However, we have found that whenever a fair amount of

turbidity is present in the water, the efficiency has been satisfactory, and, since throughout almost the entire period from July to November the river was in a turbid state, it seems fair to assume that a satisfactory efficiency was maintained at the costs named.

With reference to the costs during December, January, and February, several facts must be taken into consideration. The turbidity was comparatively low; but, on the other hand, the pollution for much of the time was high. To meet the conditions, more iron was used than was necessary to coagulate the water. In March occurred the first flood of the year. The average turbidity of the water treated was 579, which represents an amount of suspended matter of between 500 and 600 parts per million. The average cost of coagulants on five days, when the average turbidity was 1,500, was 2.78dol. per million gallons.

The following features of the process are worthy of note:—(1) The weight of the coagulum formed by the iron favours sedimentation. (2) The sedimentation basin rapidly removes the larger part of the suspended matter, and thus allows the treatment of highly turbid water without preliminary sedimentation in large and expensive reservoirs. (3) The suspended matter is utilised in the purification of the water, and hence, in a way, is an aid rather than an obstacle to purification. (4) The cost of wash-water for the filters is but little higher in periods of turbid water than in times of clear water.

The filtered water is clear and bright, and small pebbles are easily visible at the bottom of the covered storage reservoir through 20ft. of water. Bacteria of the colon type appear to be removed by the filtration in about the same ratio as are other bacteria. As to the removal of colour from the water by the treatment no data were obtained, owing to the fact that during the period of the tests the colour in the Mississippi River water was very small in amount, and any determination made would not be of much value in the consideration of the effect of the process on waters containing large amounts of colouring matter of possibly different composition.

In the operation of the Quincy plant no attempt has been made to provide for the neutralisation of the trace of caustic alkalinity appearing in the effluent. In inspection of the determinations of caustic alkalinity occurring in the effluent of the plant in normal operation shows that on some days no caustic alkalinity was detected. Usually a slight alkalinity was present, varying between 1 and 5 parts per million. (Estimated in terms of calcium carbonate.) The permanent hardness is necessarily slightly increased, as in other processes involving the use of sulphates, while the temporary hardness is decreased, the resulting total hardness being considerably reduced.

So far as observed at Quincy, the process appears to compare favourably with other methods of purification in point of efficiency and cost, and seems to be particularly adapted to the treatment of water in which periods of high turbidity are encountered. The author wishes to express his thanks to Mr. C. R. Henderson, superintendent of the Quincy Waterworks, for his interest and assistance, and to the American Steel and Wire Co., of Chicago, the manufacturers of the ferrous sulphate, for their courtesy throughout the work.

—The Engineering Record.

THE BRITISH ASSOCIATION AT SOUTHPORT.

THE thirty-eighth annual meeting of the British Association will take place the week after next at Southport, a town last visited just twenty years ago. The meeting, which begins on the evening of September 9, will be presided over by Sir Norman Lockyer, who will

probably in his address deal with spectroscopical observations, and advocate the endowment of scientific research. Three evening lectures will be delivered in the Cambridge Hall. The first of these, on the Friday evening, will be by Dr. Robert Munro, on "Man as an Artist and Sportsman in the Palaeolithic Period." The Monday evening discourse will be by Dr. Arthur Rowe, on "The Old Chalk Sea and Some of its Teachings," while the lecture to working men on Saturday evening will be by Dr. J. S. Flett, who will give an account of his observations on the recent volcanic eruptions in the West Indies. Section A, Mathematical and Physical Science, will be presided over by Mr. C. V. Boys, and several of the papers to be read in this section will treat upon recent discoveries and speculations as to the nature of radium. Professor W. Noel Hartley will preside over Section B, Chemistry. He proposes, in his presidential address to give a brief account of twenty-five years' work in spectroscopy, applied to the investigation of the composition and constitution of terrestrial matter, both organic and inorganic. Professor W. W. Watts, secretary of the Geological Society, in his presidential address to Section C, Geology, will urge the importance and uses of geology in practical life. He will advocate its adoption as a subject of ordinary education. Among the papers in this section will be one by Mr. G. W. Lamplugh on the disturbance of Junction-Beds from Differential Shrinkage during Consolidation; another by Mr. J. J. H. Teall upon the Recent Work of the Geological Survey, and a third by Mr. H. W. Monckton on Sarsen Stones. A number of papers dealing with particular features of the geology of various localities have also been arranged for, including an account by Mr. J. Lomas of the geology of the country around Southport. The first report of the committee appointed at Belfast to investigate the fauna and flora of the Trias of the British Isles will be presented; it deals with the study of foot-prints, and Mr. Beasley furnishes the bulk of the report. Section D, that of Zoology, meets under the presidency of Professor Sydney H. Hickson, and Section E, Geography, under that of Captain Etrick W. Creak, C.B., R.N., who proposes to treat of the connections between geography and terrestrial magnetism. Among the papers to be read in Section E are those by Mr. J. J. Parry, of Liverpool, on the Afforestation of Waterworks Catchment Areas, and by Mr. E. A. Reeves, curator to the Royal Geographical Society, on Improved Methods of Survey for Travellers. Section F, Economics, Science, and Statistics will be presided over by Mr. E. W. Brabrook, C.B. The president of Section G (Engineering) is Mr. Charles Hawksley, and the papers to be read in this section include one by Lieutenant-Colonel Crompton, R.E., C.B., on "The Problem of Modern Street Traffic," another by Mr. J. Clarkson on "Steam Propulsion on Roads," a third by Mr. W. F. Goodrich on "Refuse Destructors and Power Production"; and among other contributions will be papers by Mr. Bell on "Oil Fuel," Mr. Woodhouse on "The Newcastle Power Works," Mr. T. Parry on "The Water Supply of South-West Lancashire," Dr. Campbell Brown on "The Growth of Organisms in Water-Pipes," and Mr. B. Hopkinson on "The Paralleling of Alternators." Professor J. Symington, of Queen's College, Belfast, is the president of Section H (Anthropology). Dr. Arthur Evans, Mr. J. L. Myres, and Mr. R. C. Bosanquet will offer reports on this year's excavations in Crete, Mr. J. Garstang and Mr. Currelly on recent work in Egypt, Mr. G. Clinch on a Surrey monument illustrative of certain points in Stonehenge, Mr. Annandale on stone implements from Iceland, Dr. C. S. Myers on the Ruins of Kharga in the Great Oasis, Mr. T. Ashby on Roman work at Caerwent, and Mr. Garstang on Ribchester; while a report will be made as to the Silchester excavations. Professor Ridgeway will read a paper on "The Origin of Jewelry." Section K (Botany) will meet under the presidency of Mr. A. C. Seward, whose address will be devoted to the subject of fossil plants, and Sir W. de W. Abney, K.C.B., will preside over Section L (Educational Science).

BOOKS RECEIVED.

San Pictures of the Norfolk Broads (Ashstead, Surrey: P. Jennings) has reached a third edition. It is illustrated by about 100 photographs of the picturesque Norfolk and Suffolk borderland by PAYNE JENNINGS, the descriptive letterpress being furnished by E. R. SUFFLING. — *Jarvis's Guide to Great Yarmouth* (Norwich: Jarrold and Sons) is abundantly illustrated and well written. The chapters on Charles Dickens and on the Rows will be read with interest, and although we may not entirely agree with Peggotty that the town is "on the whole the finest place in the universe," it possesses in itself and surrounding neighbourhood many attractive features. The architectural tourist will find it a good centre from which to visit the Cathedral at Norwich, with its wealth of Norman and Perpendicular work, and the numerous 14th and 15th century examples of church architecture with which the district is thickly set, not the least interesting being the great parochial church of St. Nicholas, which dominates the Market-place of Yarmouth itself. A useful addition to future editions of the book would be a map of the coast and a plan of the town. — *Holidays in Eastern Counties and Summer Holidays in East Anglia* are illustrated booklets by PERCY LINDLEY, published under the auspices of the Great Eastern Railway Company. — *Roof Framing Made Easy: a Practical System adapted to Modern Construction for Laying Out and Framing Roofs*. By OWEN B. MAGINNIS, architect, Inspector of Buildings of the City of New York. Second edition, revised. (New York: The Industrial Publication Company). — This little manual is intended to instruct students in carpentry, who desire to become proficient in this particular branch of construction. It is full of diagrams of roofs for every purpose, and the author shows how to lay out the lines of roof-framing without unnecessary cutting and waste. The chapters originally appeared in a series of articles in *Carpentry and Building and The Carpenter*. The chapters show how to lay out and frame roofs of every kind. In the laying out of simple roofs the description of finding out the hip-rafter's length is not quite clear: the point N is not determined, though the diagram given explains. Hip-and-valley roofs, roofs of irregular span, pyramidal and polygonal roofs, conical roofs, truss roofs, framing a church roof, mansard roof, hemispherical domes, &c., are all explained, and illustrated by diagrams, plans, and sections, which accompany the list. The methods shown are practical and easy, and the student of carpentry will find Mr. Maginnis's book a useful guide in framing roofs of various shapes on geometrical principles.

CHIPS.

A stained-glass window has just been erected in Holy Trinity Church, Scarborough, in memory of the late Rev. J. A. Faithfull, a former curate of that parish, and rector of Whitechapel from 1900 to 1902.

At Mornish, Perthshire, the Elvira Henderson Memorial U.F. Church was formally opened on Monday. It is built of stone, and is furnished in oak. In the east wall is a stained-glass window which itself cost £1,300.

On Saturday afternoon Archdeacon Barber, of Chester, dedicated a new stained-glass east window which has been erected in St. Michael's Parish Church, Coppenhall, Crewe.

The new schools, Egremont, Cumberland, are being warmed and ventilated by means of Shorland's patent Manchester grates and special inlet tubes. The same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A stained-glass window has been placed in the Congregational Church, Wheathampstead, as a memorial of the late Rev. J. S. Hoppus, for 27 years pastor. It represents the Saviour holding the cup of Communion, and has been executed by Messrs. Jones and Willis, of London.

The Madras Railway Company have completed and opened another section of their Calicut-Azikh Extension between Tellicherry and Cannanore (13 miles); and are pushing on with the Azikh-Mangalore Extension, the construction of which they have in hand on behalf of the Government of India.

On Saturday Lieut.-Gen. Sir John French unveiled a war memorial at Retford in memory of the Sherwood Rangers Imperial Yeomanry and members of the Regulars, Militia, and Volunteers who died in South Africa during the late war. It took the form of a large tablet erected on the grand staircase of the Retford town-hall.

OBITUARY.

We regret to announce the death, on Wednesday at Marstrand, Sweden, of Professor WILLIAM HENRY CORFIELD, sanitary adviser to his Majesty's Office of Works, and professor of Hygienic and Public Health at University College, London. Dr. Corfield, who was in his sixtieth year, was educated at Cheltenham Grammar School, Magdalen College, Oxford, University College, London, and the medical schools in Paris and Lyons. Among the appointments which he filled were those of honorary sanitary adviser to University College and Hospital, president of the Epidemiological Society of London, vice-president of the Sanitary Institute, and past-president of the Society of Medical Officers of Health. For the last twenty years he had been an Honorary Associate of the Royal Institute of British Architects. In 1868 he was appointed examiner for honours in the Natural Science School, Oxford, and he discovered the existence of lithodorous borings in the Aymestry limestone of the Silurian formation, and "thus removed to an earlier age than had been previously known the evidence of boring bivalves." He was not only the first professor of hygiene appointed in London, but he started the first hygienic laboratory, which was at University College. For six years he was a member of and reporter for the British Association Committee on the treatment and utilisation of sewage, and he originated, in 1891, the meeting of the International Congress of Hygiene and Demography in London. The Royal Society of Public Medicine in Belgium awarded Professor Corfield a bronze medal in 1901 for his work in connection with public health. For 20 years he was chairman of the committee of the Sunday Society, the object of which is the opening of public museums and libraries on Sunday. In addition to being a member of many foreign scientific societies, he was a prolific author of works connected with public health, and as a fluent and lucid lecturer his addresses on sanitary topics were much valued. Among his publications are a "Résumé of the History of Hygiene," "Dwelling Houses: their Sanitary Construction and Arrangements," "The Laws of Health," and "Disease and Defective House Sanitation," which was translated into French, Hungarian, and Italian.

It is with much regret that we hear of the death, on the 22nd inst., of Mr. THOMAS WARDROP, one of the senior members of the firm of Harris and Wardrop, builders and contractors, 10 to 14, Wallwood-street, Limehouse, E. The business will be carried on as heretofore by the remaining partners, Messrs. Edwin Harris, Clarence Gregory, and James Wolfe King.

An accident took place at Woodhatch, Reigate, on Thursday morning in last week, resulting in the death of Mr. W. Wood, architect and surveyor, of Ifield, Crawley. Mr. Wood and a friend had taken part in the cycle carnival at Reigate on behalf of local charities, and were returning home. The night was very dark, and Mr. Wood ran his machine into a letter-box fixed on the side of the pavement. He was thrown to the ground, and was picked up dead by his friend, having broken his neck.

THERE were interred at Prestwich on Friday the remains of the late Mr. JAMES LAMB, a well-known Manchester man, who died at Kenwood, Altrincham, on the 14th inst., in his 87th year. The deceased was born in Quay-street, Manchester, on January 2, 1817. He learnt the trade of a cabinet-maker and upholsterer, and about the year 1841 set up in business on his own account at 24, Bridge-street, moving in 1848 to John Dalton-street in that city. Many years afterwards he built a spacious furniture warehouse in the same street, which he occupied until the amalgamation of his business with that of Messrs. Goodall a few years ago.

The extension of the joint Harbour Station at Portsmouth is now complete. The extension is built upon wrought-iron girders, resting upon cast-iron piles 18 in. in diameter, screwed by steam power to a firm bottom. Messrs. J. W. Jacomb-Hood and Mr. C. L. Morgan were the engineers for the joint companies, the resident engineer in charge of the works being Mr. W. Davidson. The contractors were Messrs. John Aird and Co., of Westminster, represented by their manager, Mr. A. C. Reid, formerly resident engineer to the South Australian Government service. The whole of the wrought and cast iron was supplied and erected—save the screwing of the cast-iron piles—by Messrs. Head, Wrightson, and Co., Ltd., of Thornaby-on-Tees.

The St. Pancras Borough Council have made £46,612 profit on their electric-lighting plant in ten years.

The will has been proved of Henry Loxley, of Southbourne, Hillsborough, Ecclesfield, builder, who died on June 9. Gross value of estate, £9,041; net personal estate, £4,352.

Building Intelligence.

ARMAGH.—The cathedral of St. Patrick, which has been for nearly two years in the hands of the builders, is now nearing completion, so far as the present restoration is concerned, and will be formally reopened on September 4. The new east window, filled with glass in memory of the Beresfords—Lords John, Marcus, Gervais, and Mr. Beresford Hope—will be dedicated. It replaces an old stunted window, with patchwork glass and pointed stone tracery and mullions, and is a reproduction of the choir window, portions of which were discovered built up in the wall when the masons were cutting the space for the new window. Sir Thomas Drew promptly adopting the older portions and incorporating it in the design. The roof has been considerably raised, the old imitation lath-and-plaster work having been taken away and the roof timbered. This necessitated a lining of the chancel throughout with stone, and a raising of the tower openings east and west.

FELIXSTOWE.—Arrangements have just been concluded for the erection, at Felixstowe Dock, of a 200-quarter steep malting for Messrs. J. Gough and Sons, of Bury St. Edmund's, and for the building of eight workmen's cottages, four to be used in connection with the malting, and the other half for dock hands. These buildings will be raised on the South Quay. The Felixstowe Dock Co. have decided to develop the North Quay, so as to provide the extra berthing accommodation required. The work will entail a cost of upwards of £10,000, and the malting, cottages, and concomitant sidings and connections with the Great Eastern Railway system a further £20,000 or more. The dock company's engineer, Mr. John Russell, who has also been superintending the erection of a sea wall and promenade, has now made arrangements for piling and concrete work sufficient to carry the large building. In the first instance separate tenders were sent in for the foundations; but it was subsequently considered desirable to place the whole of the South Quay work in the same hands, and Messrs. Spencer Santo and Co., of Kensington and Felixstowe, have been successful in obtaining the combined contracts, and the work is to be commenced forthwith. The architects are Messrs. Evans and Son, of Nottingham. The extension of the dock itself will be carried out by Messrs. P. W. Symmons and Co., Cannon-street, E.C. Their contract requires them to excavate the present temporary concrete-covered slope, erect a straight quay-wall, and dredge down to the deep sea level of the dock. The working facilities of the dock will be further improved by the extra sidings and lines of rails as already mentioned. The present timber store will be converted to the use of the Malting Company, and it is proposed in future to do most of the timber trade at the new quay, alongside which a new timber shed will be erected.

NEWCASTLE-ON-TYNE.—On Wednesday week the memorial-stone of new buildings in course of erection in connection with the Westmoreland-road Presbyterian Church of England was laid by Sir George B. Bruce. The new buildings occupy a site which has stood vacant since the church was built in 1872, and originally intended for a manse. The additions consist of two parts—an entirely new building on the vacant site in Westmoreland-road, and alterations to the existing caretakers' buildings in Maple-terrace. The front block contains a room on the ground floor for session and managers, with small hall for week-night service and other meetings. The first floor contains a ladies' room with cloakrooms, and the kitchen, &c., for caretaker, the second floor or attics being occupied as sitting-room and bedrooms for the caretaker. In the basement there are heating chamber and lavatory accommodation. The existing caretakers' house in Maple-terrace will be made into a classroom. The building will be raised one story in height, with a vestry provided for the minister at church level instead of in the basement, the existing vestry being enlarged to form a classroom. The work has been designed by and is being carried out under the superintendence of Messrs. Badenoch and Bruce, Newcastle, architects, and Mr. J. M. Whammond, of Gosforth, is the contractor.

SOUNDWELL.—The foundation-stone of a new church was laid at Soundwell, near Bristol, on Saturday. The architect is Mr. H. M. Bennett, of Liverpool Chambers, Corn-street, Bristol, and

the building will be Gothic in character. The estimated cost for the entire scheme is between £5,000 and £6,000, but at present only about £2,500 is to be incurred in the construction of the nave and north aisle. The church when erected will seat 900 persons, and will serve a population of about 4,000. In addition to the work now to be put in hand, the scheme comprises a chancel and choir stalls, clergy, choir, and parish vestries, organ chamber, and a south aisle. The dimensions are 100ft. by 65ft. About 450 people will be accommodated in the present part of the work. The exterior stonework will be of blue Pennant, relieved with Bath stone, and the interior of free-stone. The floor will be of wood-blocks, and there will be chair-seating arrangements. Provision is made for a belfry in the west gable.

CHIPS.

His Honour Judge Lush-Wilson, K.C., and a jury of five had a long sitting at Tavistock on Saturday, when Edwin Benjamin Tregaskis, aged twenty-nine, stonecutter, of West-street, Penryn, claimed from Duke and Co., Ltd., of Tor Quarry, Merivale Bridge, Tavistock, £266 for personal injuries caused by an explosion of a dynamite cap in a shed where he was dressing stone. Under the Workmen's Compensation Act, the Court made an order that plaintiff, the sight of whose right eye had been affected, should receive 14s. 9d. weekly.

The Lord Mayor of London, Sir Marcus Samuel, laid on Friday the foundation-stone of the new Monckton Drill Hall in College-road, Maidstone. The building is being erected at a cost of £1,300, the front and gateway being faced with Kentish rag. Mr. A. W. Smith, of Maidstone, is the architect.

No fewer than 130 applications have been received from architects, engineers, and others for the position of master of works to the Glasgow Parish Council and District Lunacy Board.

Professor Boni, under whose directions the excavations in the Roman Forum have assumed such importance, has just discovered the colossal base which sustained the equestrian statue of Domitian. It stands 5ft. below the present level, and is 40ft. long, 20ft. wide, and 10ft. deep.

It has been decided that the electric trains for the Metropolitan District Railway shall be worked on the same system as was recently adopted by the Central London Railway Co. in place of the heavy separate locomotives originally used on that line. Mr. Yerkes has accordingly just placed a contract with the British Thomson-Houston Co., Ltd., of Rugby and London, for the equipment of all the District Company's new trains with the Sprague-Thomson-Houston system of "multiple unit train control," which is in use not only on the Central London, but also on the elevated railways of New York and Boston, and was recently adapted by the New York Rapid Transit Company for their new subway system now nearing completion in that city.

The demolition of the old Caledonian Asylum in Caledonian-road, which was for many years the home of the destitute Scottish children of London, has been commenced by order of the London County Council.

Mr. Pouley, gas manager to the Stafford Corporation, has had his salary increased from £400 to £450 per annum.

The Home Office have purchased several acres of land near the site of the British Museum buildings at Hendon for a central vaccine station.

The Lord Bishop of Beverley on Wednesday week dedicated a new stained-glass window of three lights in the chancel of Liverton Church. The new window is situate in the chancel over the altar. The centre light represents St. Michael, the patron saint of the church, slaying the dragon, whilst the right and left-hand openings respectively depict figures of St. Gabriel and St. Uriel. The window was executed by Messrs. Wailes and Strang, Corporation-street, Glasgow.

The proposal of the Pontefract Board of Guardians to purchase Beechwood House and Estate for £3,500, for use as a children's quarters, has been vetoed by the Local Government Board.

Messrs. C. Chancellor and Co., of 13, Clerkenwell-road, E.C., inform us that some months ago Mr. Fife, the architect, informed them that he had been submitting their Velure to severe tests for a considerable time, and had decided to use it on the *Shamrock*. She was painted before launching, and their paint appears to have given entire satisfaction. Velure has also been adopted for use both on the Sandringham Estate and at Windsor Castle, as well as on the Royal yachts. Local authorities are using it for painting outdoor work, and it has been adopted by a large number of hospitals, including the London and the Middlesex, owing to its cleanliness and its sanitary properties.

Engineering Notes.

CONNEL FERRY AND OBAN.—In connection with the opening of the Ballachulish extension of the Callander and Oban line, the Caledonian Railway Company are in course of carrying out extensive alterations and improvements at Oban and Connel Ferry stations. At Oban the platform accommodation has been largely extended and improved, there being now two island platforms, both some 600ft. in length, one averaging 35ft. and the other 20ft. in width. Adjacent to the latter platform a new approach road 30ft. wide has been formed, giving direct access to the new pier extension. The railway company are expanding on the extension of the pier and contingent improvements some £60,000, and in view of the opening of the new line these works are being hurried to completion. They comprise an additional wharfage line of 500ft., the work being constructed in timber piling, chiefly greenheart, with cattle slipways and stairways for small boats. At Glencruitten summit, midway between Oban and Connel, a new passing place for trains has been completed and opened, the line between Callander and Oban being a single one. At Connel Ferry the main up and down lines have been brought alongside an island platform of great length, and with a maximum width towards the centre of 40ft. The main station buildings are situated on the north side of the station, and waiting-room and lavatory accommodation have been provided on the island platform. The island platform is connected with the platform and dock set apart for Ballachulish traffic by an over-bridge. Extensive siding accommodation has been laid down, and two signal boxes have been erected. These alterations have been carried out from the plans of Mr. D. A. Matheson, chief engineer of the Caledonian Railway Company.

PWLLHELI HARBOUR.—Preparations are now in progress for starting the construction of the new harbour which has been designed for Pwllheli. The scheme provides for the construction of (1) an inner harbour or marine lake, and (2) an outer harbour or harbour of refuge. Within the inner harbour will be built up an island of about eight acres in extent, which will be planted and laid out. On one side of the inner harbour will be constructed a stone embankment, extending from the present terminus of the Cambrian Railway to a point near Mitre-terrace, where it will join the present Cob embankment. This will enable the Cambrian Railway Company to extend their system into the very heart of the town; and it has been agreed that the embankment shall be proceeded with first, so as to enable the railway company to erect their new railway station as early as possible. Provision will also be made by the company for a junction with the proposed Pwllheli to Nevin Light Railway. The scheme is estimated to cost something like £55,000, and towards this the Government are contributing £22,500, the Cambrian Railway Company £20,000, and the Corporation of Pwllheli £17,500.

Halifax School Board, at their meeting on Monday night, had submitted to them a proposal by the sites and building committee to invite competitive plans for the erection at Salterhebble of a school to provide accommodation for 300 mixed and 150 infant scholars, at a cost not exceeding £10,000, including mechanical ventilation.

Boring operations for testing the site of the new deep-water dock at Swansea have now been completed with satisfactory results. The trustees will shortly invite tenders for carrying out the scheme, involving two millions sterling.

The construction of a railway from Chamonix to Martigny has been begun, and at each end the first section is now under construction. When completed the total length of the line will be 24 miles, including three miles along the valley from Vernayaz to Martigny, as the junction with the main line will be at the latter and not at the former station. From Chamonix to Châtelard the new line will be in French territory, and thence to Martigny in Switzerland. The Vernayaz-Salvan section is to be completed in time for the season of 1904. The Salvan-Finhaut portion will require two years, and the Finhaut-Châtelard one more, so the whole line will not be opened till 1907.

There has just been placed in the drawing-room at Auckland Castle, among the portraits of his predecessors, a replica of the portrait of the late Bishop Westcott in the Fitzwilliam Museum at Cambridge, by Sir William Richmond, R.A.

PROFESSIONAL AND TRADE SOCIETIES.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The members of the Incorporated Association of Municipal and County Engineers held a Northern District conference in Aberdeen on Thursday in last week. On Friday the delegates made a number of visits of inspection to places of interest in and near the city, amongst others the bathing station, the Aberdeen granite works, the Adamant works and Dancing Cairns quarry, Slopefield and Mannofield reservoirs, and Culter pumping station.

YORKSHIRE BUILDING TRADES FEDERATION.—The monthly meeting of the executive of the Yorkshire Federation of Building Trade Employers was held at Scarborough on Friday, Mr. J. Dawson (Muddersfield) presiding. There was a large attendance of representatives. A new apprentice indenture form and a new form of contract agreement were approved, the latter being recommended for use by all architects and engineers. A report on the joiners' dispute at Sunderland was read, and it was resolved to give the masters the necessary support in the event of a stoppage of work. It was decided to hold the next meeting at Billington in September.

CHIPS.

Mr. Edward Daniel Bridges, aged 51, retired builder, of Gloucester-street, Cirencester, died suddenly on Monday, about 5 p.m. He had been in ill-health for some time.

At Burrow-in-Furness, on Tuesday, Princess Louise, Duchess of Argyll, opened the new Technical School, erected at a cost of £1,500, as a memorial of the Diamond Jubilee of Queen Victoria.

The rural district council for South Westmorland have directed Mr. Harrison, C.E., of Preston, to prepare detail plans and sections of a 5in. main pipe from Lupton Fells, near Kirkby Lonsdale, for the supply of Lupton, Farleton, Heversham, Levens, Holme, Milnthorpe, Storth, and Araside. The main will extend about 12 miles, and the supply will be 100,000 gallons daily, while the cost is estimated at £10,000.

At the forthcoming congress of the Library Association at Leeds, Mr. Norris Mathews, the city librarian of Bristol, has been asked to open a discussion on the important question of "Library Architecture and Planning." Mr. Norris Mathews, having initiated the opening of the new branch libraries for Bristol in St. Philip's, St. George, Cheltenham-road, together with a smaller one at Ridgway, his practical advice was sought in connection with the new Central and Reference Library, to be erected in D-aurey-road from designs by Mr. H. Percy Adams, of London, recently selected in competition.

On Friday in next week, Sept. 4, Colonel W. Langton Cole, of the Local Government Board, will hold an inquiry into the application of the Bradford Corporation to borrow £22,500 to defray the cost of providing district baths in Wakefield-road, Leeds-road, and in Peel Park.

The Corporation of Margate have decided to erect a sea-wall and promenade of the width of 30ft. at the east end of the town. The cost is estimated at £30,000.

The public memorial at Exeter to Sir Redvers Buller will take the form of an equestrian statue. The commission has been given by the committee to Mr. Adrian Jones.

The Newcastle Corporation have given instructions to Messrs. Wm. Potts and Sons, clock manufacturers, Newcastle and Leeds, to erect a new clock in the tower of Christ Church, Shieldfield, Newcastle-on-Tyne, and have let the builders' work to Mr. Alex. Bruce, Newcastle. Messrs. Potts and Sons are just completing a new clock at Elton Church, near Hull, to the memory of the late Col. Grimston, J.P., High Hall, Elton, from Lord Grimthorpe's designs.

The plaster of Paris and cement manufacturing enterprise of Joseph Robinson and Co., carrying on operations in Cumberland and Westmoreland, shows a decline of profits amounting to £1,623 for the year ended June. The dividend rate is maintained at 5 per cent.—not the highest in the company's history—but the carry-forward is only £137 against £1,122 brought into the account.

Work in connection with the rebuilding of Bow Bridge has been commenced. The enterprise is being carried out as a joint improvement by the London and the Essex County Councils, and, in view of the forthcoming electrification of the East London tramways, will be pushed on with all speed. The new bridge will be some 8ft. wider than the existing one, will have easier gradients, and will cost nearly £10,000.

WATER SUPPLY AND SANITARY MATTERS.

THE LONDON WATER COMPANIES' CLAIMS.—When the Court of Arbitration appointed under the Metropolis Act of last session met on October 25 next, they will have before them the claims of the eight Metropolitan water companies, amounting to £50,000,000, in addition to their debenture stock being taken over by the newly-created Water Board. The Water Board have deposited with the Court of Arbitration their answers to the claims of the East London and the New River Companies. The claim of the former company shows that the capital of the company consists of debenture stock £2,051,000 and of ordinary share capital £1,720,000. The debenture stock is taken over by the Water Board, and in respect of their nominal capital of £1,720,000 the East London Company claim sums amounting in the aggregate to £7,214,000. The Water Board replies that over and above the £2,051,000 charged which they take over, they are not prepared to offer any further sum of money in respect of the undertaking. The board points out that the available supplies of the East London Water Company are practically exhausted, and that the large district which is dependent upon them cannot be supplied in the future without very large additional expense. The company depend largely upon the water of the river Lea, which is subject to serious pollution. The New River Company claims under various heads an amount of £11,666,000. The main point of the answer of the Water Board is that the sources of water supply which the company are entitled to bring into account for the purpose of their claim will be wholly insufficient to meet the demands of the population of their district. This company will be largely dependent upon its share of water obtainable by means of the Staines reservoir scheme, in which they are partners with the Grand Junction and the West Middlesex water companies; but under the Staines Reservoir Acts, it was provided in the event of a purchase the company should not be entitled to make any claim in respect of the advantages conferred upon them by, or resulting from, the Acts. The Water Board indicate that, in addition to the liability involved in taking over the debenture stocks of the company, which amount to £2,250,000, they are willing to pay in respect of the undertaking of the company the sum of £3,090,000, which exceeds the amount that has been expended by them upon the undertaking. Under the orders made by the Court of Arbitration, which consists of Sir Edward Fry, chairman, Sir Hugh Owen, and Sir John Wolfe Barry, the answers of the Water Board to the claims of the remaining six water companies have to be lodged at various dates during the month of September.

BIRMINGHAM.—The members of the Scientific Society of the Birmingham and Midland Institute visited on Friday the new waterworks of the Corporation at Frankley. This reservoir, which is intended for the storage of the water after its long dark journey from the Elan Valley, is now ready to discharge its function. As the Welsh water scheme has not, however, sufficiently progressed to allow of this being done, the reservoir is being temporarily used for the storage of water from the present supplies, and this is pumped to Frankley from the Monument-road works in Birmingham. The basin, which has walls of masonry and a concrete floor, has a depth of 30ft., and at the present time it is little more than three-parts full. The reservoir is, to a large extent, an adaption of a natural hollow in the side of a hill, which is crowned by Frankley Beeches. On the western, the curved side, the walls are supported to a great extent by the soil, while on the opposite side, to the east, a straight wall is strengthened by an embankment 37ft. high, stretching across the country for a quarter of a mile or more. This has had the effect of closing in what was the open side of a picturesque valley. The reservoir is one of the largest of its kind in the Kingdom. It has a water area of 25 acres, with a holding capacity of 200,000,000 gallons. A stone wall 7ft. in diameter, perpendicular to the dam, divides the reservoir into two sections. Eight sluice gates near the dam will enable the two halves to be used together or separately. On the inside, where the reservoir walls are faced with blue brick, the walls have a hollow curve. Immediately behind the blue bricks, but divided from them by a thin layer of asphalt, is the main wall, formed of massive concrete blocks, backed up by a series of blue brick arches. The concrete blocks are divided by sheets of brown paper. Thus the setting of any one block, or its expansion or shrinkage through atmospheric changes, is prevented from affecting its neighbours, and so causing a weakening of the structure. The walls have an average thickness of over 30ft. at the bottom, and of about 30in. at the top. It will take a couple of days for the water to travel from the Elan Valley to Frankley. The flow will be at the rate of 2ft. a second. As soon as the reservoir fills to a depth of 30ft. an electric bell will be set ringing in the pumping station, and communication is then opened up with the Elan Valley, where water is shut off. As it leaves its source the water is quite good; but in order to rid it of any undesirable properties which

might be in suspension fourteen filter beds—quadrangular tanks, varying in size from 150ft. to 220ft. square—have been constructed. The filtering material consists of a layer of sand above layers of gravel of gradually increasing coarseness. Speaking generally, the water will flow by gravity to Birmingham. For the purpose of feeding the higher parts of the city some power is, however, necessary; but the water which will have to be pumped is equal to rather less than one-eighth of the whole supply. Two small reservoirs have been constructed, one on the hill at Northfield and the other at Warley. The water will be raised by three engines, the largest of which being of 76H.P. The lifting capacity of these engines is equal roughly to something like 1,000 gallons of water per minute. The present demands of the city upon Frankley are such that it will take about 100 days to empty one division of the reservoir. Mr. A. Wilfred Lewis, the resident engineer at Frankley, explained to the class on Friday the working of the reservoir and of the waterworks generally.

HEYWOOD SEWERAGE WORKS.—At their last meeting the health committee of the Heywood Town Council had under consideration the tenders for the construction of filtration areas at the Heap Bridge Sewage Works, including the storm-water filters; also for the construction of storm-water filters with storm-water sewers, &c., in connection with the Botany Works. The bacterial filters and works in connection therewith at Botany are being deferred until after the storm-water filters are constructed. The tenders further included the construction of a river wall alongside the Roach at Botany, which will serve as one of the outer walls for the new storm-water filters. There were six tenders, and that of Mr. James Berry, of Heywood, was accepted, the amount being under £7,000. The work is being carried out in accordance with the plans and scheme prepared by Mr. J. Diggle, C.E.

LEGAL INTELLIGENCE.

DEVIATION FROM APPROVED PLANS.—At the Llandudno Police-court on Monday, Robert Luther Roberts, a Llandudno builder and contractor, was summoned for erecting dwelling-houses without submitting proper plans to the urban district council. Mr. Conolly, clerk and solicitor to the urban council, prosecuted. He stated that in October, 1902, the council approved of plans for the erection of three houses on a site at the corner of Balfour and Harcourt-roads, Llandudno, and on June 25 this year the surveyor reported that the defendant had deviated from the approved plans, and was proceeding to erect two houses in place of the three previously intended to be erected, without submitting fresh plans. The defendant did not appear, and was fined £5 and costs.

ACTION BY AN ARCHITECT.—Before Judge Greenwell, at Morpeth County-court, Osborne Blyth, architect, Ashington, brought an action on Monday against Thomas Crozier, farmer, Sheepwash, for £516s. 6d., for drawing and preparing plans and specifications for four cottages which the defendant proposed to erect and incidental charges. The defence set up was that the defendant had not received the plans, the plaintiff having declined to hand them over pending payment of his fees and other charges. Judgment was entered for the plaintiff for 18s. 6d., the cost of advertising.

IN RE G. R. H. WALES, OF SOUTH HACKNEY.—At the London Court of Bankruptcy on Monday, before Mr. Walter Boyle, Assistant Receiver, a first meeting of creditors was held under the failure of George R. H. Wales, who was described as of 130, Cassland-road, South Hackney, builder. It appeared from the debtor's statements that he began business as a builder about twelve years ago with a small amount of capital. He had since erected a large number of houses in the neighbourhood of Acton, Chiswick, Harlesden, and elsewhere, and he attributed his present position to inability to realise various properties, and to loss on a contract. A statement of affairs was filed showing liabilities £31,794, of which £6,204 was expected to rank, and an estimated surplus in assets of £390. The debtor submitted no proposal, and Mr. A. C. Bourner, chartered accountant, was nominated as trustee to wind up the estate in bankruptcy. A committee of inspection was appointed.

The Bedwelly Board of Guardians have decided to enlarge the workhouse in accordance with plans prepared by Mr. D. Morgan, of the firm of Messrs. James and Morgan, Cardiff. It is estimated that the extensions will entail an expenditure of £27,886.

The death took place on Monday at Stranton House, Foggy Furze, West Hartlepool, of Mr. John Forster, formerly a well-known builder and contractor at Hartlepool and West Hartlepool. The deceased, who was 69 years of age, retired from business about ten years ago. Mrs. Forster predeceased her husband some years ago, but they have left a numerous family.

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ILLUSTRATIONS.

CENTRAL LIBRARY, HAMMERSMITH.—LANCASHIRE AND CHESHIRE BAND OF HOPE AND TEMPERANCE UNION NEW BUILDINGS, MANCHESTER.—ST. GEORGE'S PLACE, KNIGHTSBRIDGE.—THE PADDOCK, RUSKINGTON.—ST. OSWALD'S CHURCH, WEST HARTLEPOOL.—FIRST PREMIATED DESIGN FOR NEW FREE LIBRARY, MAIDENHEAD.

Our Illustrations.

CENTRAL LIBRARY, HAMMERSMITH.

IN a limited competition this design, by Mr. Henry T. Hare, F.R.I.B.A., P.A.A., was placed first by the assessor, Mr. Aston Webb, R.A., P.R.I.B.A., and is to be erected near the Broadway, Hammersmith. The whole of the designs were fully reviewed in the BUILDING NEWS, June 26, 1903. The other competitors selected by the borough council to compete were: Mr. Maurice B. Adams, Mr. Sidney R. J. Smith, Mr. J. Henry Richardson, Mr. E. W. Wimperis, and Mr. G. Sedger. Each of these competitors was paid 25 guineas towards his expenses in the competition.

THE LANCASHIRE AND CHESHIRE BAND OF HOPE AND TEMPERANCE UNION NEW BUILDING, DEANS-GATE, MANCHESTER.

THIS building, which will shortly be erected upon an excellent site in Deansgate and Bootle-street, Manchester, will be composed of buff terracotta and 2in. stock bricks. The Union will occupy half the ground floor, half the basement, and will have offices and a board room on the first floor as well as a large hall on the top floor. This hall covers most of the building area, and will be lit at the sides, and by lantern lights at the top. A carefully considered system of heating and ventilation will obtain. The basement will be let as a restaurant. The design, which is illustrated herewith, is that of Messrs. Chas. Heathcote and Sons, architects, Manchester, and was first premiated in the competition for the building.

ST. GEORGE'S PLACE, KNIGHTSBRIDGE.

THIS block of buildings is being erected in connection with the Knightsbridge building scheme, upon land the property of the Ecclesiastical Commission. A condition of the releasing of the property, which is chiefly in 20ft. frontages, was that the Commissioner's architect, Mr. W. D. Caroe, should design the exterior, and be responsible for its detail, with the object of securing a monumental result and a harmonious group of buildings. The arrangement has, on the whole, worked satisfactorily, although it is one which depends largely upon the human equation. In some cases everything has worked most easily and satisfactorily, and with general advantage to all parties, while in others endless and unnecessary difficulties have been raised, which have only been overcome by resolute insistence on the part of the freeholders. But upon important sites, which have to be largely subdivided, there is no doubt that the scheme is one that might be more frequently adopted with advantage.

THE PADDOCK, RUSKINGTON.

THE Paddock, Ruskington, for Dr. Thompson, is an old house, added to and restored by Messrs. Brewill and Bailey, of Nottingham, and on the

plan are indicated the old and new work. The accommodation provides a spacious entrance-hall, dining-room, drawing-room, consulting-room, and kitchen offices, &c., and the exterior is constructed with red brick up to the first-floor level, the upper part being covered with roughcast and roofed with red tiles. The accommodation on the first floor consists of five bedrooms, with dressing-room, bathroom, &c.; and the work has been ably carried out by Mr. Frank Pattinson, builder, of Ruskington.

ST. OSWALD'S CHURCH, WEST HARTLEPOOL.

THIS church is the gift of Mrs. Matthew Gray, in memory of her husband. It is built partly of Hesleden stone from a local quarry, and partly of Ancaster stone, which was used after the local quarry gave out, the facing inside and out being of coursed rubble blockers. The whole of the roof timbers are of pitch-pine. The floors are of pitch-pine wood blocks throughout. The chancel steps are of Languedoc and Pavonazza marble. The whole of the internal wood fittings are of oak of a somewhat elaborate description. The reredos is of oak richly carved, having sculptured panels in high relief, and carved figures in the niches, all the sculpture being from the designs of Mr. J. Eadie Reid. One of the features of the church is a rood-beam with groining and tracery below, surmounted with a handsome carved cross. The font is of alabaster, with an oak canopy, both of which are richly carved. The carving in oak is by Mr. Ralph Hedley, and the stone-carving by Mr. R. Beall, both of Newcastle. A fine organ is being built by Messrs. Ingram, Hope Jones, and Co. with electrical blowing apparatus. The church is to be lighted by electricity. Sitting accommodation for 800 is provided. A peal of eight bells is being cast by Messrs. J. Warner and Sons, who are also making the clock. The east window will be fitted with stained glass from the studio of Mr. Herbert W. Bryams, of London, also one of the windows of the morning chapel. The church was designed by the late Mr. William Searle Hicks, and is being completed under the superintendence of the present firm of Messrs. Hicks and Charlewood, of Newcastle-on-Tyne. The builders are Messrs. Thos. Dickinson and Son, of West Hartlepool.

MAIDENHEAD FREE LIBRARY COMPETITION.

THIS design was awarded the first premium by Mr. Edward W. Mountford, F.R.I.B.A., eighty-six designs being submitted. The amount to be expended was small (£5,000), which was to include fittings, furniture, fees, &c. This had to be taken into consideration when designing, and to cut down cost the librarian's quarters were placed in the roof, although none of the rooms would be attics. In cubing 10jd. per foot was allowed for superstructure above ground floor, and 6d. per foot for basement and air-spaces, making a total of £3,687, leaving £1,313 fittings, furniture, fencing, architects' and surveyors' fees. The council of the borough of Maidenhead, however, have decided to build from the second premiated design. The architects of the design we illustrate are Messrs. Blangy and Van Baars.

As a marble-producing state Georgia may, says an American technical journal, rival Vermont. The marble belt is about sixty miles in length, extending in a south-westerly direction from the North Carolina line through Pickens County. The supply is practically inexhaustible, as the depth of the deposit in many places is over 100ft. Both white and coloured varieties are found.

A new Sunday-school is being built in connection with the Nantwich Congregational church. It will have a central hall for 350 scholars, 65ft. by 35ft., five classrooms, and an infants' classroom. It will be faced with red facings, with buff terracotta dressings. The architect is Mr. Richard Matthews, and the builders are Messrs. Cox and Vaughan.

Lord Llangattock has undertaken to defray the cost of paving the sanctuary and chancel of St. George's Church, Camberwell, with marbles of various colours. He will also fill one of the upper windows—that in the south-east corner of the church—with a figure of the patron saint.

A memorial reredos at Holy Trinity, Ayr, was dedicated on the 9th inst. The reredos takes the form of a triptych of considerable dimensions and elaborate decoration, and was designed by Mr. F. L. Pearson, son of the late Mr. J. L. Pearson, R.A., architect of the church, and under whose superintendence the church, from his father's designs, was completed. The new nave of the church was opened on All Saints' Day, 1900.

COMPETITIONS.

LIMERICK CARNEGIE FREE LIBRARY AND MUSEUM.—The assessor appointed by the trustees (Mr. Ashlin, President of the Royal Institute of Architects in Ireland) awarded the first prize to the designs submitted by Mr. George F. Beckett, of Dublin, and the second prize to those sent in by Mr. George P. Sheridan, of Dublin. The trustees have decided to adopt, for the building of the library and museum, the second premiated design, as they considered the elevations of a more permanent and suitable character.

LUTON.—The selected designs submitted in a limited competition recently held for the Baptist Schools, Wellington-street, Luton, comprise a large hall with galleries around, sixteen classrooms, church parlour, infants' room, cloak-rooms, &c., and the usual conveniences. The whole of the rooms will be electrically ventilated. The estimated cost is about £1,600. The authors of the selected design are Messrs. George Baines, F.R.I.B.A., and Lt. Palmer Baines, 5, Clement's Inn, Strand, London, W.C.

STONE, STAFFS.—A committee of the Stone board of guardians have received competitive plans for proposed new tramp wards from Messrs. Jones and Hilton, who estimated that the work could be carried out for £975; Mr. J. J. Chapman, whose estimate was from £1,300 to £1,400; Mr. R. Arrowsmith, jun., £1,200; and Mr. A. P. Miller, £1,000. It was proposed that Messrs. Jones and Hilton's plans should be recommended to the board for acceptance, and an amendment that Mr. Chapman's plans, with certain modifications, should be recommended, was moved and seconded, but the voting was equal. It was then moved that both sets of plans should be submitted to the board. Mr. Chapman to be requested to amend his plans showing the combination room reduced to six beds, the corridor to 4ft., and the stoneyard wall left out, and Messrs. Hilton and Jones to amend their particulars by showing a concrete roof to the cells instead of slate; and this resolution was carried *nem. con.* It was also decided that the other plans should be produced at the board meeting. When these recommendations came before the board it was agreed that Messrs. Arrowsmith and Miller should also be conceded the privilege of amending their plans. An amendment that the whole of the plans should be laid before an expert was not supported.

At a meeting of the Leeds Art Gallery Committee on Tuesday, a letter was received from Sir Jas. Kitson, M.P., offering to present to the permanent art gallery collection a valuable picture entitled, "Her Most High, Noble, and Puissant Grace," by the late P. H. Calderon, R.A. The committee gratefully accepted the offer. The picture, which will be on view to the public on Monday next, was painted in 1865, being exhibited at the Royal Academy some years ago, and also at the Paris Exhibition. It represents her Grace of Prussia as a child of nine or ten years making a solemn procession through the State apartments, wearing her crown, and attended by maids of honour and trumpeters.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made by them for the construction of light railways in the urban districts of Quarry Bank, Brierley Hill, and Rowley Regis.

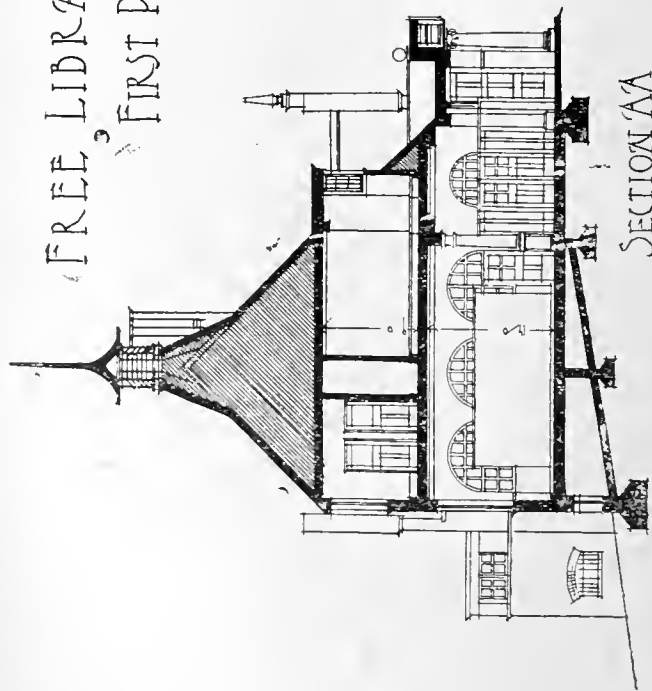
The death is announced of Alderman John Hardaker, J.P., retired builder, of Bradford. He was a member of the city council for thirty-four years. He was formerly a partner in the firm of William Hardaker and Son, contractors. He was a Conservative and a Churchman, and for many years was president of the Bradford Old Choral Society and the Bradford Musical Union.

St. John's Church, Fife, is about to be renovated and enlarged; a new chancel is to be built, also an organ-chamber, chapel, and vestries. The alterations are estimated to cost £3,000.

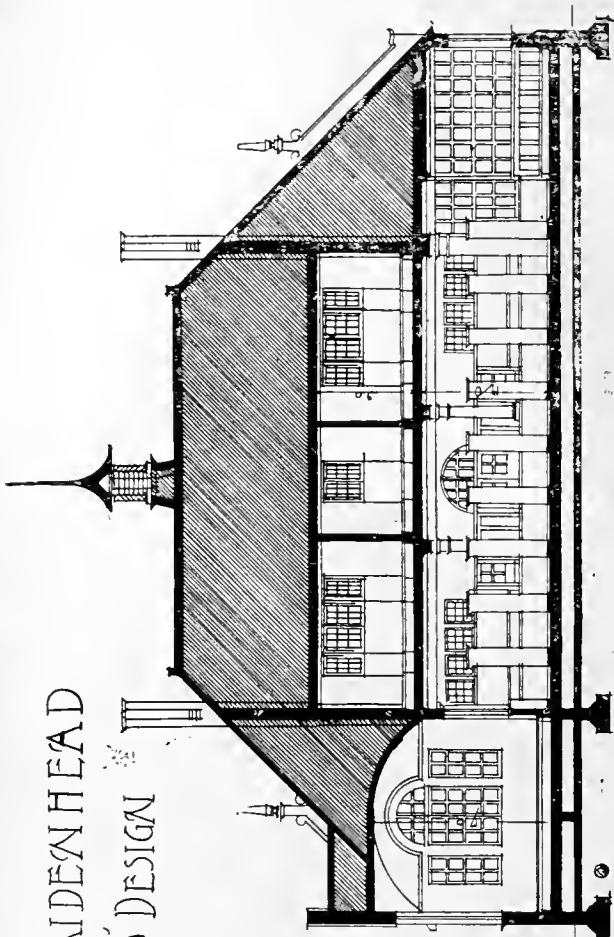
An invitation is being issued by the Oxford Union Society to past and present members to contribute to a fund for the erection of a bust of the late Marquis of Salisbury in the Debating Hall. Lord Salisbury was not only one of Oxford's greatest sons, but was secretary to the society in 1848, and treasurer in 1849. Already Mr. Gladstone has been similarly commemorated in a bust by the late Mr. Onslow Ford, R.A. The commission has been intrusted by the society to Mr. George Frampton, R.A.

The Local Government Board has intimated its approval of the purchase by the Leeds Corporation of the Bramley Fall Wood estate for cemetery purposes. The site proposed to be purchased comprises an area of 69 acres, and the purchase-price has been agreed upon at £13,950.

FREE LIBRARY, MAIDENHEAD
FIRST PREMATED DESIGN

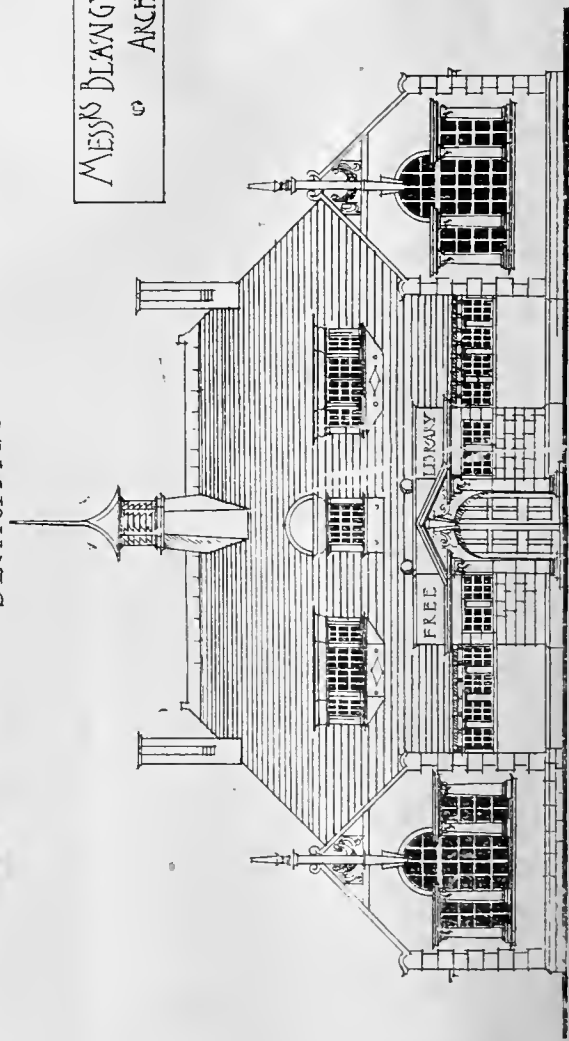


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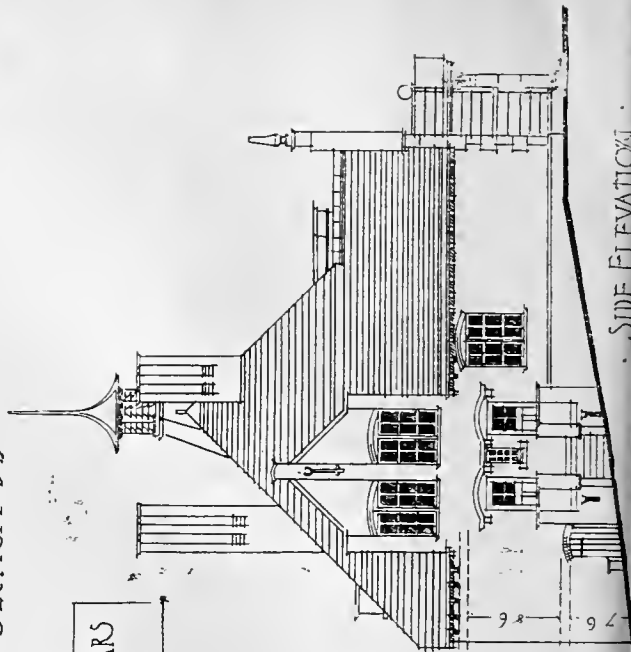


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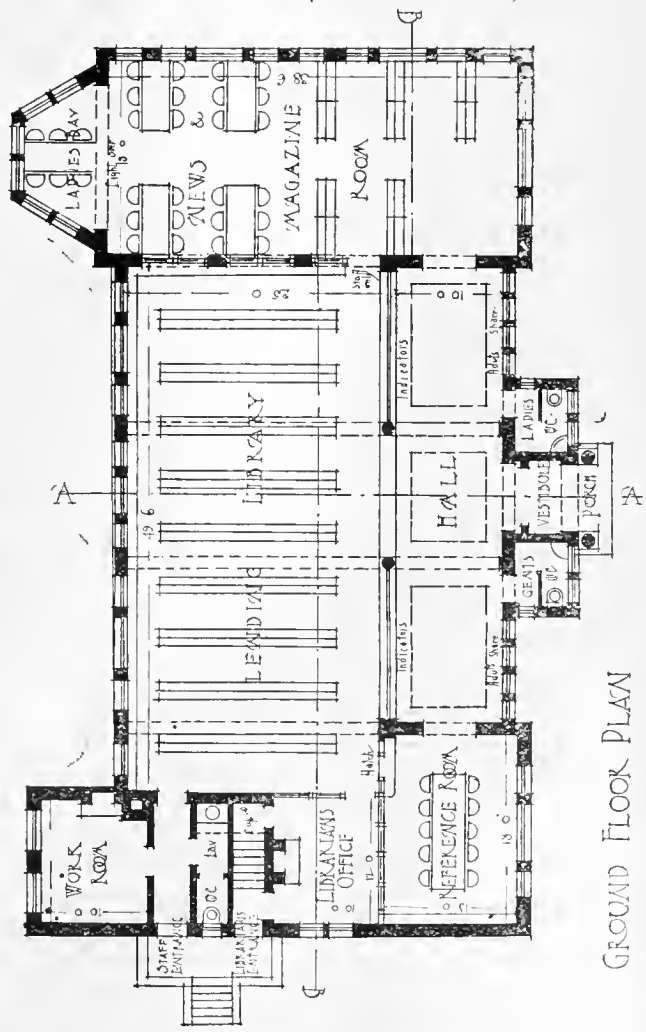
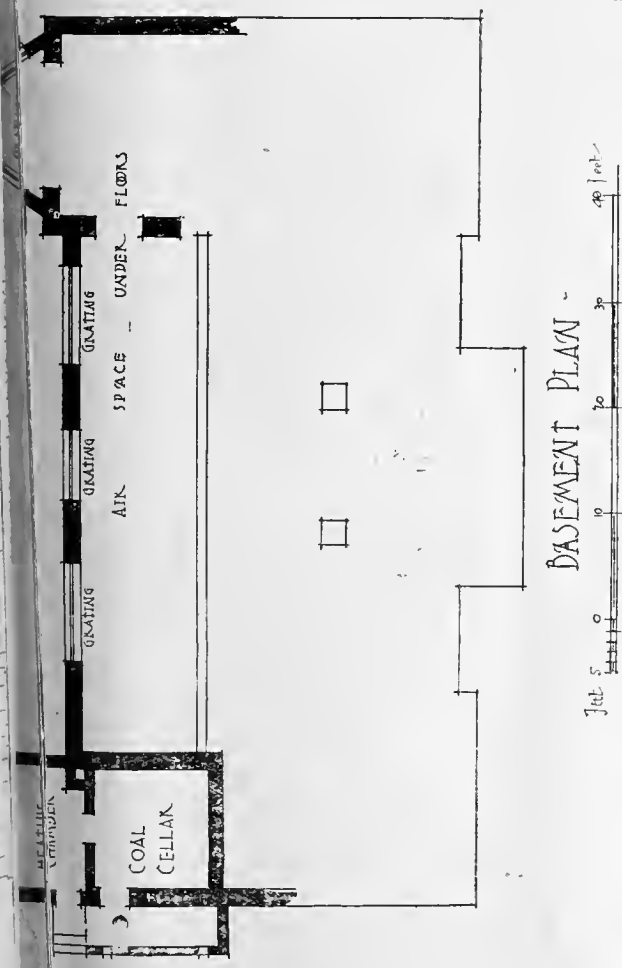
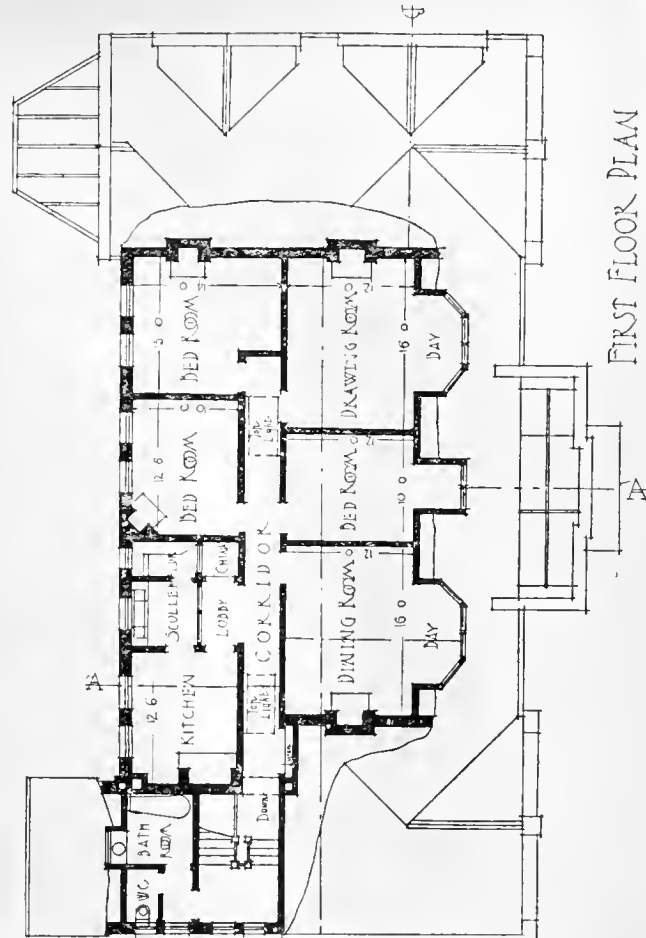
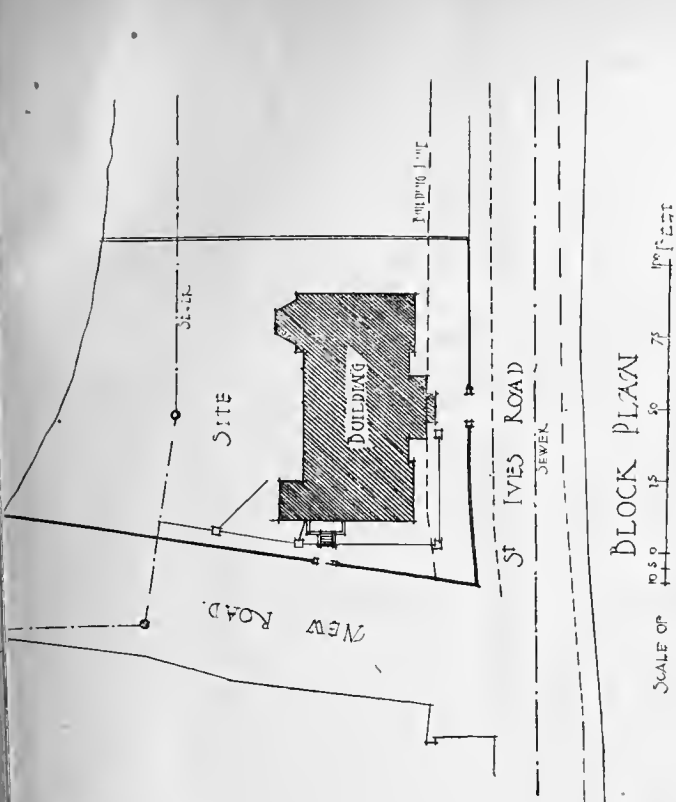
MESSRS BLANGY & VAN BAARS
ARCHT^S

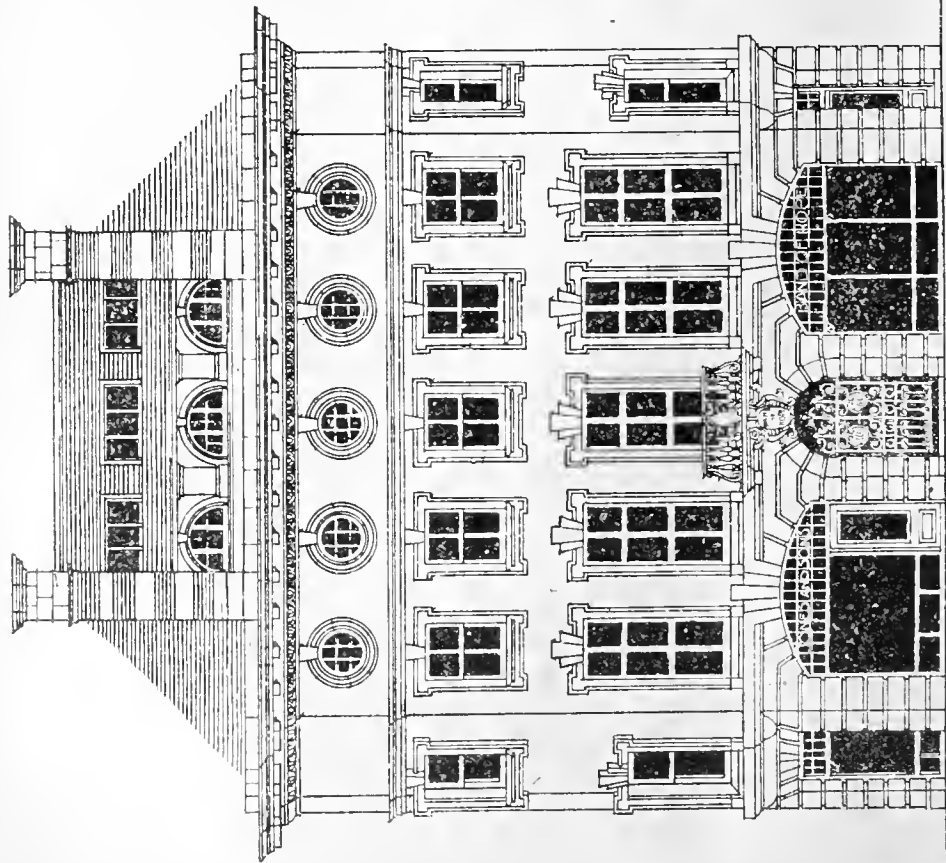


FRONT ELEVATION

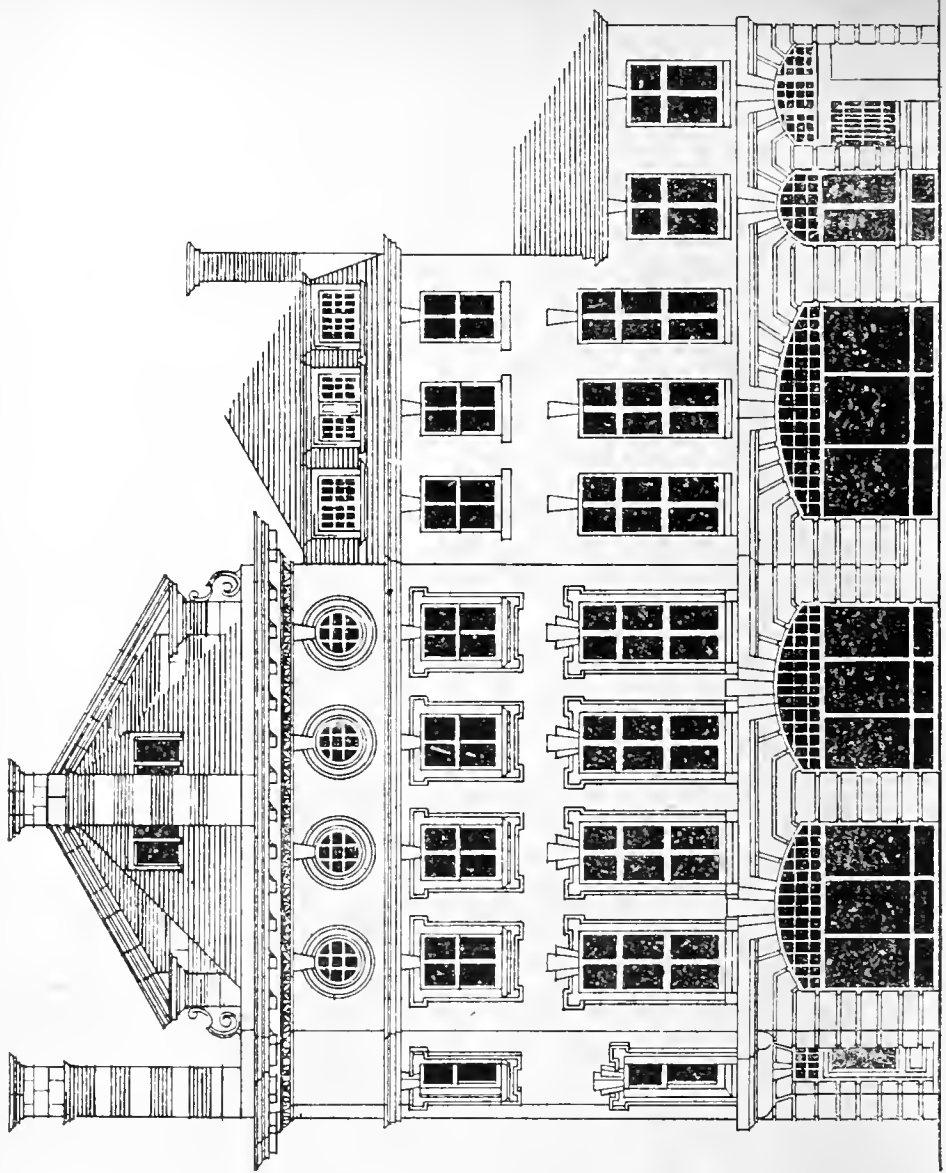


SIDE ELEVATION





ELEVATION · TO · DEANSGATE ·



ELEVATION · TO · BOOTLE · STREET ·

LANCASHIRE AND CHESHIRE BAND OF HOPE AND TEMPERANCE UNION NEW BUILDING, MANCHESTER.

· CHAS. HEATHCOTE AND SONS, Manchester, Architects. ·

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telephone No. 1633 Holborn.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Situations and Partnerships.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—S. T.—M. A. L.—W. R. and Co.—G. W. S.—T. M. and Co.

Correspondence.

TWO MORE UNSATISFACTORY COMPETITIONS.

To the Editor of the BUILDING NEWS.

SIR,—The following accounts of two competitions, for one of which conditions have just been issued, and of the other, information received as to the promoters' decision upon the designs submitted, may serve as a warning to intending competitors, and as a protest to promoters.

The Leyland Urban District Council advertise for competitive designs for laying out land for municipal and other purposes in Church-road and Sandy-lane. The land comprises some 11,992 square yards, part of which is required for municipal buildings, fire-station, depot buildings, &c., and part for streets and building sites.

The plan is to be made upon mounted double elephant paper to a scale of 20ft. to an inch, and is to show provision for the following:—Site for municipal buildings, fire-station, steam-roller house, three cart sheds, water-fitters' shop, lamp store (to hold 150 lanterns), scavengers' store, highways store, and a commodious stockyard; also for five private slaughterhouses. After providing for the foregoing, the remaining portion of the land is to be laid out in building sites. Sections, dimensions, areas, levels, and gradients are to be marked upon the drawings.

The council offer one premium only of 15 guineas to the author of the design placed first in their opinion; but no premium will be paid, if in the opinion of the council no design be worthy thereof.

All designs are to become the sole property of the council.

The council do not undertake to carry out the remediated or any other design, and no allowance whatever for such design beyond the premium (if

awarded) will be made, and in the event of the payment of the 15 guineas, the recipient shall not be entitled to ask the council to engage his services any further." The council "alone will decide which design shall be accepted, or to reject the whole." They "reserve the right to adopt wholly or partially any of the designs, or to work the same in conjunction with other designs."

The council are evidently under the impression that municipal buildings, fire-station, slaughterhouses, numerous stores, &c., can be satisfactorily shown upon a plan by means of certain spaces with a distinguishing colour and a descriptive note. They overlook the fact that to arrive at the necessary space required the conscientious planner would have to spend much time and thought, based upon a special knowledge of many classes of buildings and involving a fairly detailed design, before the few lines could be laid down to represent adequately the various sites. It is remarkable that public and municipal bodies should so frequently endeavour to obtain plans and information involving an amount of work on the part of the competitors immensely out of proportion to the compensation offered. The unsatisfactory nature of the conditions is obvious. It is regrettable that the profession has encouraged the public to issue such invitations by so frequently accepting them. It is to be hoped that in this instance there will be but scant response, and that as many architects as have obtained conditions will return them, with their reasons for so doing.

The instance of the recent decision of promoters is in connection with the Magnus Grammar School Competition, Newark-on-Trent. Three premiums were offered of £25, £15, and £10 for designs which should be adjudged to be of sufficient merit to be placed first, second, and third. The designs which obtained premiums were to become the property of the governors. The following is a copy of a letter received by a competitor:—"The governors of the Magnus Charity beg to return the designs for schools you kindly sent in, and regret that none of the plans submitted are, in the opinion of the governors, suitable to justify their adoption."

The governors of the Magnus Charity evidently consider that the politeness of their letter is sufficient compensation for the labour of the competitors. It is to be hoped that it may be possible to awake them to a sense of their obligation.

The members of this society were warned that this was an unsatisfactory competition to take part in, and steps were taken to induce the governors to appoint a proper assessor.—I am, &c.,
HENRY A. SAUL, Hon. Sec.

Competition Reform Society,
10, Gray's Inn-square, W.C.

A DOUBLE EVENT.

SIR,—You noticed recently that one firm of quantity surveyors had been appointed to both departments of the London County Council, and, although I have no interest in the matter, it appears to me hardly fair to the ratepayers, as there are so many good firms who might naturally desire to have some of the work. I notice that many old firms are not on the list, while some comparatively new ones have been selected. The rate of pay is not high, and the responsibility great.—I am, &c.,
FAIRPLAY.

ADEL CHURCH.

SIR,—While thanking you for the extremely interesting and well illustrated article upon the above in your current issue, it occurs to me that some of your readers may be glad to know that a most able paper on the subject, by the Rev. G. Lewthwaite, is to be found in the *Transactions* of the Associated Architectural Societies of Lincoln, York, Sheffield, Northampton, Bedford, Worcester, and Leicester for the year 1868. The paper is illustrated, and is especially noteworthy from an antiquarian point of view.—I am, &c.,
NEVILLE B. DAVIS.

89, Clarendon Park-road, Leicester, Aug. 24.

ST. MARY'S CHURCH, ISLINGTON.

SIR,—This church, erected in 1751 at a cost of £7,340, is now being restored at a cost of about £13,000. This is the greatest waste of money possible. The old nave should have been pulled down, the tower only being restored and retained. A nice new church, with proper nave and chancel, could be erected for the amount—a credit to the parish.

The present barn-like nave is badly built, ugly in design, and the stained windows are bad in design and colour; yet the existing east window, it is reported, will be used again at the end of the new chancel. The ugly galleries will also be retained.

What the parishioners are thinking about I cannot imagine, as there is not a single feature of interest in this product of a time when art was dead, and Church matters at a very low ebb.—I am, &c.,
CANONBURY.

MEASUREMENT OF OBSTRUCTED LIGHT.

SIR,—With reference to your article under the above heading in the issue of the 21st inst., I would point out that Mr. Molesworth's ingenious theories do not deal with the following:—(1) No allowance is made for clouds, which of course vary considerably in different parts of the country. (2) The varying values of the angle of incidence of the sun upon the windows is not taken into account. (3) The distance of the obstructive erection from the building owning the easements is not taken into account provided that the angle of obstruction is not increased. The reflective light obtained from such areas is often of immense value. (4) It is a necessary corollary of the author's work that if no sky is visible there will either be no light in a room, or if there be any light it will be of no value. (5) The system is useless for determining the injury to the best light one can obtain—viz., from the north.—I am, &c.,
H. PHILLIPS FLETCHER.

29, New Bridge-street, Ludgate-circus, E.C.

RUTLAND COURT, S.W.

SIR,—In the description of Rutland Court, Knightsbridge, my design for which you are good enough to illustrate in the current number of the BUILDING NEWS, you state that the cost of the work was about £12,000. This is obviously a printer's error, and I shall therefore be obliged if you will allow me to state that the cost was about £120,000.—I am, &c.,

DELISSA JOSEPH, F.R.I.B.A.
Portland House, 73, Basinghall-street, E.C.
August 26.

Intercommunication.

REPLIES.

[11998].—Turkey Houses.—"Poultry Architecture," 100 illustrations, by G. B. Fiske, published 1902, by Orange, Judd, and Co., New York, to be had through B. T. Batsford, High Holborn, W.C., Chapman and Hall, Henrietta-street, W.C., speaking of Ontario house, gives dimensions as 12ft. square, 10ft. high, and 8ft. at the back. Foundations of tamarack planks spiked together, four posts at corners. Sides of fine slabs, 4in. wide, nailed in, apart for light and air; within roof of boards to exclude rain, &c. Wm. Cook, "How to Make Poultry Pay." In 1899 it was published in England at Queen's Head-yard, Borough, S.E., Walden's, St. Mary's Cross, or by E. W. Allen, Ave Maria-lane, E.C. There is a large work by Lewis Wright, "Book of Poultry," published by Cassell and Co., 1893, which mentions a case of a triangular house, of match-boarded or rough slab, with joints covered by caulking pieces. Width on ground 7ft., height 8ft. Shelves with perches over, hinged to walls, nests under and got at by raising shelf. Gives strength for least material and labour, height, floor-space where needed, good slope for rain, the metal gutter or strip of felt over top easily arranged to give free ventilation at every apex. House 12ft. long, 50 fowls (as many as should be kept together); cost £3 to £3 10s. E. Taylor, of Welwyn, Herts., could no doubt fit up a place, if desired.—REGENT'S PARK.

[11998].—Turkey Houses.—Turkeys thrive best on high and dry land, and the sleeping-house should never be enclosed, even in the coldest weather; the houses should have only wide netting in the front. I advise the houses being inclosed on three sides and roofed over, the side next to the south being open. Each house should be sufficient for at least one cock and six hens. With ten hens the eggs are fertile. The birds must be kept free from vermin, and must have flint grit and plenty of pepper.—H. LOVEGROVE.

[11999].—Acoustics.—"Architectural Acoustics," by E. H. Kelly, Buffalo, N.Y., published by himself, I suppose, at 10 dollars, at pp. 66-7, does not approve of wires stretched top of rooms. The wire only stops the one-hundred-and-twentieth part of sound-wave. Wire cloth, with meshes not over 4in. apart, will, in nearly all cases, stop reverberations. Perhaps B. T. Batsford or Chapman and Hall, both London, could procure book, if they do not stock it. Then there is, at 1s. 6d., No. 116, Weale's series, "Acoustics of Public Buildings," by T. R. Smith, 1895. Probably B. T. Batsford stocks this.—REGENT'S PARK.

Mr. W. P. Hartley, J.P., of Aintree, has offered to bear the expense of further enlarging the Primitive Methodist College, Whalley Range, Manchester. The extension will provide accommodation for 40 additional students and cost about £10,000.

Our Office Table.

THREE fresh pictures have just been hung on the walls of the National Gallery in Trafalgar-square, where the works for the isolation of the structure from other buildings have just been completed. Sir William Agnew has presented a portrait of Mrs. Hartley and her child in the character of a "Nymph with the Infant Bacchus," which was at the winter exhibition of the Old Masters at the Royal Academy in 1902. It is placed in Room XVIII. A portrait of an elderly man by Lucas Cranach the elder has been presented by Mr. J. P. Heseltine, one of the trustees. It is hung in Room XV. A picture by Zubaran has been purchased from the collection of the late Louisa Lady Ashburton. It represents a young lady in the character of St. Margaret; the dragon, the emblem of this saint, is seen in the background. It is hung in Room XIV.

Mr. F. W. Ruck, the county surveyor of Kent, has just presented to his county council his annual return, showing the net expenditure upon the roads for the year ended March 31 last to have been £88,413 16s. 5d., or £148-47 per mile on 595m. 3f. 14p., against £92,324 17s. 1d., or £155-07 per mile, the previous year. The gross contract expenditure amounted to £83,865 5s. 11d., or £140-85 per mile; and the county surveyor draws attention to the fact that this is the expenditure exclusively upon maintenance and repairs, and that it compares with £85,846 2s. 2d., or £141-18 per mile the previous year, showing a reduction of £1,980 17s. 3d., equal to £3-33 per mile, although, he adds, "the extension of the use of foreign material has been continued." But it is greatly in excess of the three years 1898-1901, the figures for which are respectively £131, £121 10s., and £128 4s. 5d. per mile. Mr. Ruck further particularises the fact that the expenditure on footpath improvements, amounting £1,892 12s. 2d., was the largest for the five years given, and that other improvements of various kinds cost £3,668 2s. 8d., these sums, together with others beyond that covered by contract, amounting to £11,728 3s. 3d. and being equal to £19-7 per mile. The gross quantity of material used for coating the roads was 95,693 cubic yards, which was a saving of 6,022 cubic yards on the previous year, with a reduction in cost of £1,663. And it is anticipated that a still further reduction will be possible in the current year. The roads of Kent are at the present time, he remarks, with very few exceptions, in a sound condition, and certainly better able to withstand the traffic brought upon them than at any previous date. The comparative tables, however, show the total expenditure to have been higher than in any of the previous years enumerated. It was £96,697 7s. 10d., against £94,874 7s. 10d. in 1901-2, £82,052 19s. 6d. in 1900-1, £75,690 18s. 10d. in 1899-1900, and £83,783 5s. 7d. in 1898-9. Some suggestive tables are given by Mr. Ruck, showing the comparative outlay on various materials required for road maintenance. Thus there were 44,427 yards of quartzite used, costing £39,590, against 46,391 yards, costing £41,300, in 1901-2, and 41,535 yards, costing £36,094, in 1900-1. Scotch and Guernsey granite were employed for the first time, the former to the extent of 946 yards, costing £802, and the latter to the extent of 834 yards, costing £793. There were 32,603 yards of flint utilised, involving a cost of £11,354. The gravel used was 920 yards, and it cost £325. Rock was used to the extent of 2,951 yards, and to the cost of £1,095. The total quantity of material used was thus 95,693 yards, costing £59,161. The cost per yard for the three years was £12-3 in 1902-3, £11-9 in 1901-2, and £11-2 in 1900-1; and the cost per mile was £99-36 in 1902-3, £102-15 in 1901-2, and £90-87 in 1900-1.

THE Report on Wholesale and Retail Prices in the United Kingdom in 1902, demanded by the inquirers into the operation of Free Trade, has just been published as a Parliamentary pamphlet of 454 pages. It contains, in addition to much information as to current prices, a series of 188 statistical tables and charts giving comparisons of wholesale prices extending in one case over a century, and in the others over thirty years. The statistics as to retail prices, here compiled for the first time, are naturally more restricted in scope. A return as to the prices of bricks in the Glasgow district has been specially furnished by the Glasgow Master Brickmakers' Association. It shows that the cost of stocks, ex-carriage, averaged on June 1 25s. per 1,000 in 1902, as

against 27s. 6d. at the corresponding period in 1901, and 30s. in 1899 and 1898; it was 27s. 6d. in 1898, and had stood at 25s. from 1893 to 1897. The maximum and minimum prices during the past forty years were 35s. in 1873 and 21s. in 1881. Slates and slate slabs have, according to the official statistics issued by the Home Office, shown little variation in price during the last twenty years. In 1902 the average value per ton at the quarries was £2-80, against £2-67 in 1901, £2-61 in 1900, and £2-79 in 1899. The figures as to the value of cement extend over sixty years, and are based on the declared values of exports. In 1902 these averaged £1-72 per cwt., against £1-91 in 1901 and £1-87 in 1900. From 1873, when it averaged £3-04, there has been a steady fall in value, the lowest point having been reached in 1894 at £1-62. The declared value of firwood, at per load of 50 cubic feet, was last year £1-37 for hewn and £2-55 for sawn, showing a slight but steady fall in prices since 1898. Forty years ago the values were £3-27 for hewn and £3-08 for sawn, the latter term including in each case split, planed, or dressed wood.

IN the course of a paper read last week before the Municipal and County Engineers and Surveyors, at their Aberdeen Meeting, by Mr. William Dyack, the borough engineer of that city, the author remarked that the most common size of granite setts employed in the streets of Aberdeen are as follows: 4in. cubes, 4in. by 5in. setts, 3 1/2in. by 4in. setts, 3 1/2in. by 6in. setts, 4in. by 6in. setts, and occasionally 3 1/2in. by 7in. setts. The prices per ton delivered in the works in Aberdeen for the respective setts are as follows: 4in. cubes, 29s.; 4in. by 5in. setts, 26s.; 3 1/2in. by 6in. setts, 26s.; 4in. by 6in. setts, 24s.; 3 1/2in. by 7in. setts, 27s. The various sizes of setts above enumerated, when laid in position, occupy the following area in superficial yards—viz., one ton of 4in. cubes will lay 5-239; a ton of 4in. by 5in. setts, 4-472; a ton of 3 1/2in. by 6in. setts, 3-722; a ton of 4in. by 6in. setts, 3-541; and a ton of 3 1/2in. by 7in. setts, 3-250. The actual cost of laying amounts in each case to practically one shilling per superficial yard, according to the class of street to be paved.

THE annual report of Mr. John Price, the city surveyor of Birmingham, states that there were erected during the past twelve months 1,733 premises, scheduled under the following denominations:—Houses and shops, 1,348; business premises, 29; warehouses and shopping, 109; miscellaneous, 40; alterations and additions, 196; churches, 5; chapels, 1; schools, 5. There were 2,252 plans deposited in respect of new buildings, and this total is somewhat low compared with those for the previous years. In 1898 the number of plans deposited was 2,026; 1899, 2,946; 1900, 1,849; 1901-2, 3,506; and 1902-3, 2,252. During the past year nineteen new roads, or parts thereof, of an aggregate length of 2 miles 1 furlong 57 yards, have been declared public highways, whilst the length of streets and roads in the city not at present declared is about 9 1/2 miles. On March 31 last the length of declared highways in the city was 266 miles 5 furlongs 93 yards, the mileage of the various kinds of roadway being as follows:—Macadam, 219 miles; granite, 27 miles; wood, 12 miles; wood and macadam, 3 miles; granite and macadam, 3 1/2 miles. The lighting of the city has been improved by the fixing of 1,109 incandescent burners in 132 important thoroughfares. The number of incandescent burners now in the city is 5,000. With regard to the Rea main sewer, the report adds that the reconstruction and diversion of this conduit from the weir at Nebells to Montague-street was satisfactorily completed in July at a cost of £37,433, the contract having been executed by Messrs. Aston W. Smith and Sons. With regard to the flooding from the Rea main sewer, a thorough investigation has been made of the entire length of this sewer from Montague-street to the city boundary at King's Norton to ascertain whether it was possible to obtain any permanent relief by alterations to existing overflows. The result showed that they were almost inoperative in times of flood. A comprehensive scheme for relieving the congested areas has therefore been prepared, and is now under consideration by the public works committee.

OUR contemporary *Indian Engineering* calls attention to the movement for the standardisation of the dimensions of bricks now in progress in Great Britain, and urges the desirability of adopting for use in India the sizes which are

finally decided upon in the United Kingdom. It is rather difficult, it is remarked, to account for the adoption of the size 10in. by 5in. by 3in. for bricks in India. In other parts of the world, and even at earlier periods in India, a less cumbersome size, such as 9in. by 4 1/2in. by 3in., has been commonly used, and there is much to be said in favour of the lighter weight as against the heavier from the bricklayer's point of view. In India, where the exertion of building with heavy bricks must of necessity be felt more than in colder countries, there is more reason than elsewhere for employing a brick that is conveniently handled, and this consideration will come to be of more consequence as the art of brick-making advances in the direction of machine-moulding, by which denser, and therefore heavier, bricks are produced. From the designer's point of view multiples of 10in. are more inconvenient to work with when reduced to feet than is the case with multiples of 9in.

THE education committee of the Cornwall County Council discussed at great length at their last meeting the proposed appointment of a surveyor for each of the nine educational districts for the purpose of inspecting and reporting on the non-provided schools. Mr. King expressed the opinion that the work was much too difficult for an ordinary surveyor. He advocated that the plan adopted in Plymouth was an exceptionally good one. There a skilled surveyor was brought down from the Midland Counties, and he reported on all the schools. The Earl of Mount Edgcumbe pointed out that the schools had been examined by the surveyor to the Education Department up to last year. Mr. J. C. Williams believed they had no power to compel alterations to voluntary schools. The chairman (Mr. R. G. Rowe) stated that was so, but they could refuse to take over a school, and steps could be taken to erect a provided school. He had had a letter from the Board of Education stating that the education authority would not have power to repair any voluntary school, that duty resting upon the managers. The meeting resolved, on the proposal of Mr. A. Carkeek, to advertise for surveyors for the nine districts, it being stipulated that they must have presented plans which had been approved by the Education Department, the remuneration to be one guinea for each school or group of schools and travelling expenses.

MR. VICE-CONSUL BERNARD BLUNT, in a report on the trade of Uleaborg for 1902, has a suggestive passage on the tar trade:—"Tar, of which between 30,000 and 40,000 barrels are exported yearly, is of the kind known as Stockholm tar, and is made in three qualities, fine, medium, and thick. Three German firms buy as a rule the greater part of the annual shipment, and sell most of the thick tar again through their London agents to the United Kingdom. A good deal of fine tar goes to Holland, but there is generally twice as much thick tar as there is fine and medium together. The merchants here would only be too glad to sell direct if the British would buy; if they did, they would save the German houses' profits, and also the British agents' commission, and also be sure of getting pure Stockholm tar, which they are not certain of doing if they buy tar which has been shipped to Hamburg and warehoused there; Archangel tar is much cheaper, and, if mixed with Stockholm tar, I doubt if anyone could detect its presence. Uleaborg has the largest export of tar after Archangel in Europe; every barrel is examined and filled up directly before being shipped, and a guarantee is given by the tar-yard inspector that the tar is pure, the barrels full, and the quality fine, medium, or thick, as the case may be. It would pay British tar importers to buy direct, and there is no reason why they should not do so."

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Builders' Benevolent Institution. Committee Meeting. 5 p.m.

TUESDAY.—Institute of Builders. Council Meeting. 4 p.m.

At the last meeting of the Tynemouth Board of Guardians the contract with Messrs. W. A. Fishburn and Co. for the building of a fever hospital pavilion and the rebuilding of a portion of the work-house boundary-wall was cancelled, at the request of the widow and sretics of the late Mr. W. A. Fishburn; and the contract was transferred to Mr. J. C. Dobinson, of Preston, at £4,800 9s. 1d., credit being given to Messrs. Fishburn and Co. for the work already done under the contract.

LIST OF COMPETITIONS OPEN.

Blackpool—New Offices, Sefton-street.....	£15	C. Arthur, 34, Victoria-street, Blackpool.....	Aug. 31
Howden, Yorks—Sewerage Improvement.....	£15	Henry Green, Clerk, R.D.C. Offices, Howden, Yorks.....	Sept. 12
Stonehaven—Additions to Town Hall.....	£10 (merged)	George Murdoch, Burgh Surveyor, Stonehaven, N.B.....	" 12
Ayr—Hospital.....	£10 (merged)	J. E. Shaw, Clerk to Lunacy Board, County Buildings, Ayr.....	" 22
Newton-in-Makerfield—War Memorial Monument (£300).....	£15 15s.	C. Cole, Hon. Sec., Town Hall, Earlstown, Lancs.....	" 25
Leyland, Lancs—Laying-out Land (11,902 square yards).....	£50, £30, £20	M. H. Wilkinson, Surveyor, 21, Towngate, Leyland.....	" 26
Brighton—Hospital for Women (Assessor).....	£30 (merged), £20, £10	Leonard Holmes, Hon. Sec., 76, West-street, Brighton.....	" 29
Dublin—Workmen's Cottages.....	£75 (merged), £25	Francis B. Ormsby, Secretary, Kingsbridge Terminus, Dublin.....	" 30
Heywood—Library (£4,500).....	30gs.	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood.....	Oct. 1
Bromley, E.—Public Library.....	£100, £50, £30	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.....	" 2
Saltwood, Elham—Sewage-Disposal Scheme.....	100,000, 75,000, and 50,000 kronen	R. Loneragan, Clerk, 11, Cheriton-place, Folkestone.....	" 7
Rawtenstall—Free Library and Town Hall (Assessor).....		A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall.....	" 12
Vienna—Machinery to Lift Boats.....		The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.....	(1904) Mar. 31
Fraserburgh—Higher-Grade School (650 pupils).....	100gs.	Alex. Henderson, Clerk to School Board, Fraserburgh.....	"
Aylesford—Single-Span Stone Bridge over Medway (Assessor).....		The Town Clerk, Maidstone.....	"

LIST OF TENDERS OPEN.

BUILDINGS.

Paddington—Room at Public Baths, Queen's-road.....	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.....	Aug. 29
Scisset—Stable and Slaughter House.....	Town Council	The Co-operative Stores, Scisset, Yorks.....	" 29
Montrose—Carnegie Public Library.....	Philip J. Fulham	J. Lindsay Grant, Architect, Manchester.....	" 29
Castle Acre, Norfolk—Oddfellows' Hall.....	Town Council	James Spencer, Secretary, Castle Acre, Norfolk.....	" 29
Drogheda—Cycle Works, &c.....	Victoria Building Club	F. H. Tallan, Architect, 356, Kildare-street, Dublin.....	" 29
Sheffield—Sale-Shops and Houses.....	Huntingdon and Isle of Ely C.C.'s	H. R. Potter, A.R.I.B.A., 115, North-street, Sheffield.....	" 29
Dunbar—Gas Manager's House.....	Docks Committee	Gregan Fulton, Architect, 30, St. Andrew-square, Edinburgh.....	" 29
Dowla—Rearrangement of Hermon Chapel.....	Guardians	A. O. Evans, Architect, Pontypridd.....	" 29
Rhymney—Twenty-Nine Houses, Rowles-square.....	Maldens and Coombe U.D.C.	J. L. Smith and Davies, Architects, Aberdare.....	" 31
Earth, Hunts—Reconstructing Wood Flooring of Bridge.....	School Board	H. Leete, County Surveyor, Huntingdon.....	" 31
Manningham—Extension of West End Laundry, Whetley Hill.....	Corporation	J. W. C. Atkinson, Architect, 1, Ivegate, Bradford.....	" 31
Chelmsford—Additions to Laundry at Workhouse.....	Caledonian Railway Co.	Chancellor and Son, Architects, Chelmsford.....	" 31
Bristol—Tobacco Warehouses.....	Guardians	W. W. Squire, Engineer, Cumberlaud-road, Bristol.....	" 31
Dover—Congregational Church, High-street.....	Joint Sewerage Committee	Cresswell and Newman, Architects, 54, Castle-street, Dover.....	" 31
New Malden—Public Offices, Fire Station, &c.....	Urban District Council	Wm. Hope, Architect, Seymour-road, Hampton Wick.....	" 31
Griffithstown—Classrooms, &c.....	Glamorgan County Council	Landowne and Griggs, Architects, Newport, Mon.....	" 31
Salcombe—Rebuilding East End of Church.....	Trustees	The Vicar, Salcombe, Devon.....	" 31
Chester—Twelve Cottages, Tower Field Gardens.....	Glasgow and South-Western Ry. Co.	The City Surveyor's Office, Town Hall, Chester.....	" 31
Eassie—Waiting-Rooms.....	Corporation	The Company's Divisional Engineer, General Station, Perth.....	" 31
Warwick—Workhouse Repairs and Alterations.....	Guardians	F. P. Trespass, 1, Church-street, Warwick.....	" 31
Pudsey—Twelve Houses, South Parade.....	Joint Sewerage Committee	J. Kendall and J. H. Bakes, Architects, Victoria-square, Leeds.....	" 31
Bow-road, E.—Repairs to Infirmary.....	Urban District Council	Edward R. Woodward, Clerk, 61, Bartholomew-close, E.C.....	" 31
Thornton-le-Fylde—Air-Compressing Station.....	Glamorgan County Council	A. Hindle, A.M.I.C.E., 44, Abingdon-street, Blackpool.....	" 31
Exminster—Alterations to County Asylum.....	Tramways Committee	E. H. Harbottle, County Chambers, Exeter.....	" 31
Whickham—Council Offices.....	Trustees	J. B. Ronton, Surveyor, Whickham.....	" 31
Pont Talbot—Additions to County School.....	Glasgow and South-Western Ry. Co.	T. Mansel Franklin, Clerk, County Offices, Cardiff.....	" 31
Sennen Cove, Land's End—Private Hotel.....	Corporation	H. White, F.R.I.B.A., Penzance.....	" 31
Manchester—Car-Repairing Works, Hyde-road.....	Urban District Council	J. Gibbons, Architect, 25, Cross-street, Manchester.....	" 31
Burton-in-Lonsdale—Wesleyan Sunday-school.....	Metropolitan Asylums Board	R. Richardson, Halfway House, Cantsfield, Kirby Lonsdale.....	" 31
Timberly—Hotel.....	Corporation	James Miller, F.R.I.B.A., 15, Blythwood-square, Glasgow.....	Sept. 1
Plymouth St. Maurice—Enlarging Farm Buildings.....	Guardians	Hellard and Bewes, Manor Office, Stonehouse.....	" 1
Derby—Tramway Car Sheds, Osmaston-road.....	Urban District Council	J. Ward, A.M.I.C.E., Borough Surveyor, Babington-lane, Derby.....	" 1
Hull—Rebuilding Offices, High-street.....	Corporation	Brodrick, Lowther, and Walker, Lowgate, Hull.....	" 1
Aylesbury—Repairing Town Hall.....	Urban District Council	J. H. Bradford, Surveyor, Town Hall, Aylesbury.....	" 1
Sigford, Ashburton—Three Cottages.....	W. Johnstone	A. Warren, Architect, Buckfastleigh.....	" 1
Carlisle—Twelve Houses, Margery-street.....	Wesleyan Mission	Johnstone Bros., Architects, 39, Lowther-street, Carlisle.....	" 2
Hull—Central Mission and Sunday School.....	H. and W. Green	Gelder and Kitchen, Architects, 76, Lowgate, Hull.....	" 2
Rotherham—Two Houses and Offices.....	Morgan and Co.	J. Platts, Architect, High-street, Rotherham.....	" 2
Cardiff—Rebuilding the Pavilion.....	Parish Council	James and Morgan, Architects, Charles-street Chambers, Cardiff.....	" 2
Greenock—Tilework at Smithston Asylum.....	Urban District Council	J. Fairlie, 36, Nicholson-street, Greenock.....	" 2
Abram—Public Offices.....	Metropolitan Asylums Board	Heaton, Ralph, and Heaton, Architects, Wigan.....	" 2
Footing Graveney, S.W.—Buildings at Fountain Hospital.....	Corporation	T. E. Aldwinckle & Sons, Archts., 20, Denman-st., London Bridge.....	" 2
Bridlington—Repairing No. 1, Victoria-terrace.....	Tramways Committee	A. E. Matthewman, Town Clerk, Town Hall, Bridlington.....	" 2
Halifax—Offices at Skircoat-road Depot.....	Welch Bros.	James Lord, C.E., Borough Engineer, Town Hall, Halifax.....	" 2
Darlington—Twelve Houses, Grey-street.....	Llanwanno School Board	W. H. Welch, 13, St. Michael's-terrace, South Shields.....	" 2
Abercromby—Carnetown Infant School (250 places).....	Macclesfield Equitable Prov. Soc.	A. O. Evans, Architect, Post Office Chambers, Pontypridd.....	" 2
Salford—Pumping-Engine House.....	Guardians	The Borough Engineer's Office, Town Hall, Salford.....	" 2
Bollington—Three Shops.....	Morgan and Co.	Whittaker & Bradburn, Archts., 19, King Edward-st., Macclesfield.....	" 2
Washington—Brick Wall and New Offices.....	J. C. Bennett	Farthing and Dunn, Architects, Newcastle-on-Tyne.....	" 2
Cardiff—Additions to Business Premises, The Hayes.....	Rural District Council	James and Morgan, Architects, Charles-street Chambers, Cardiff.....	" 2
Tredegar—Ten Houses, Georgetown.....	George White and Co.	W. S. Williams, Architect, Tredegar, Wales.....	" 3
Wrexham—Bathrooms at Fever Hospital.....	Combination Hospital Directors	G. Morison, Architect, King-street, Wrexham.....	" 3
Darlington—Rebuilding Red Lion Hotel.....	G. S. Bolster, J.P.	G. Gordon Hoskins, F.R.I.B.A., Court Chambers, Darlington.....	" 3
Llanan—Hospital Additions.....	Ystradfydwg School Board	Alexander Tweedie, Architect, 43, Lady-street, Annan.....	" 3
Lanark—Addition to Glenmount.....	Borough Council	W. H. Hill and Sons, Architects, 28, South Mall, Cork.....	" 3
Leafield—School (360 places).....	Corporation	J. Rees, Architect, Hillside Cottage, Pentre.....	" 3
Ermondey, S.E.—Offices at Town Hall, Spa-road.....	Rev. David Aiken, B.D.	R. J. Angel, A.M.I.C.E., Boro' Sur., Town Hall, Spa-road, S.E.....	" 3
London, I.W.—Coastguard Buildings at Culver Cliff.....	Metropolitan Asylums Board	Director, Works Dept., Admiralty, 21, Northumberland-av., W.C.....	" 4
Salley—Town Hall Extensions.....	Rural District Council	W. Hanstock and Son, Architects, Branch-road, Batley.....	" 4
Leoborough—Wesleyan Church.....	Guardians	John Wills and Sons, Victoria Chambers, Derby.....	" 4
Prinstewart—Presbyterian Church.....	Guardians	Vincent Craig, F.R.I.B.A., 4, Lombard-street, Belfast.....	" 4
Salley—Tower to Chapel, Cambridge-street.....	Gloucestershire Education Committee	O. J. Kirby, Borough Surveyor, Branch-road, Batley.....	" 5
Cardiff—Relaying Floors at Darent Asylum.....	Rural District Council	T. Duncombe Mann, Clerk, Embankment, E.C.....	" 5
Leamington—Congregational School Extension.....	Borough Council	C. H. Marriott, Son, and Shaw, Architects, Dewsbury.....	" 5
Leamington—Infections Diseases Hospital.....	Urban District Council	H. M. Whitehead, Engineer, Penkridge, near Stafford.....	" 7
Leamington—Rebuilding Office Premises, Albion-street.....	Guardians	Thos. Angel and Sons, Architects, 92, Albion-street, Leeds.....	" 8
Leamington, S.E.—Electric Station Extensions.....	London County Council	R. J. Angel, A.M.I.C.E., Boro' Sur., Town Hall, Spa-road, S.E.....	" 8
Leamington—Laundry Alterations, &c.....	Corporation	Ashton Veall, 84, Darlington-street, Wolverhampton.....	" 8
Leamington—Four-Roomed (18) and Six-Roomed (12) Cottages.....	Urban District Council	C. J. Dawson, F.R.I.B.A., East-street, Barking.....	" 8
Leamington—Science Buildings at Henry VIII. School.....	Guardians	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.....	" 8
Leamington—Bakery at Workhouse, Beckett-street.....	Guardians	Thomas Winn and Son, Architects, 92, Albion-street, Leeds.....	" 8
Leamington, N.W.—Four Bedrooms on Infirmary Roof.....	Gloucestershire Education Committee	A. A. Millward, Clerk, Clerk, Town Hall, Pancras-road, N.W.....	" 10
Leamington—School (900 places).....	Rural District Council	John Mackay, Architect, Richmond-place, Kingswood, Bristol.....	" 10
Leamington—Labourer's Cottages.....	Beehive Co-operative Society, Ltd.	The Clerk, Workhouse, Manorhamilton.....	" 10
Leamington—Shop and Hall.....	London County Council	W. G. Scott and Co., Architects, Victoria Buildings, Workington.....	" 10
Leamington, E.—Bandstand, &c., at Brickfield Gardens.....	Corporation	The Architect's Department, 15, Pall Mall East, S.W.....	" 11
Leamington—Lodge at Cemetery.....	Urban District Council	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings.....	" 11
Leamington—Public Offices, Morgan-street.....	Committee	Henry T. Hare, F.R.I.B.A., Architect, 13, Hart-street, W.C.....	" 14
Leamington—Four Cottages and Dormitory at Asylum.....	Great Northern (Ireland) Railway Co.	R. H. Dorman, C.S., Court House, Armagh.....	" 14
Leamington—Extension of Fitting Shops.....	Urban District Council	The Company's Engineer-in-Chief, Dublin.....	" 14
Leamington—Market House.....	Corporation	James Brown, Architect, 12, Castle-street, Shrewsbury.....	" 14
Leamington—Extension of Electric Power Station.....	Blumell Bros.	R. Morham, City Architect, Public Works Office, Edinburgh.....	" 14
Leamington—Two New Departments.....	Corporation	J. Rees, Architect, Hillside Cottage, Pentre.....	" 14
Leamington—Engine and Boiler-Houses, &c.....	Southward Union Guardians	H. W. Chattaway, Architect, Trinity Church-yard, Coventry.....	" 14
Leamington, S.E.—Roof Repairs at St. George's Workhouse.....	Admiralty	Mansergh and Sons, Engineers, 5, Victoria-street, Westminster.....	" 16
Leamington—Manual Instruction Centres.....	Education Committee	A. J. Wade, Architect, 35, Fifth-avenue, Harrow-road, W.....	" 17
Leamington—Produce Market.....	Properties Committee	Director of Works Dept., Admiralty, 21, Northumberland-av., W.C.....	" 18
Leamington—Enlargement of Post Office.....	H.M. Commissioners of Works	A. H. Bone, Architect, Cambridge Junction, Portsmouth.....	" 18
Leamington—Mercantile Marine Office.....	H.M. Commissioners of Works	J. C. Mount, Borough Surveyor, Town Hall, Lancaster.....	" 18
Leamington—Cemetery Extension Works.....	Burial Board	The Secretary, H.M. Office of Works, Storey's Gate, S.W.....	" 21
Leamington—Two Blocks of Flats.....	Soldiers' and Sailors' Fam. Assoc.	W. B. Johnson and Sons, Architects, 31, King-street, Wigan.....	" 25
Leamington—Wesleyan Church and School.....		C. E. Lancaster Parkinson, A.R.I.B.A., 44, Bedford-row, W.C.....	"
Leamington—Infirmary Buildings at Workhouse.....		Goodey and Cressall, Architects, Victoria Chambers, Colchester.....	"
		H. F. J. Barnes, Architect, Poole.....	"

BUILDINGS—continued.

Leeds—Additions to Meatwood-road Council School	Education Committee	W. S. Braithwaite, Architect, Calverley-street, Leeds	—
Kewick—Reslating Black Lion Inn and Cottage		Jennings Bros., Ltd., Castle Brewery, Cockermouth	—
Hull—Villa, Newland		John M. Dossor, A.R.I.B.A., 2, Manor-street, Hull	—
Cardiff—Additions to Corrugated-Iron Building	Committee	Teather and Wilson, Architects, Andrews's Bldgs., Queen-st., Cardiff	—
Two Mile Hill, Bristol—Bell Inn		C. and C. Thompson, Athenaeum Chambers, Nicholas-st., Bristol	—
Pudsey—Reseating Wesleyan Chapel, Church-lane	Guardians	Danby and Simpson, Architects, 10, Park-row, Leeds	—
Watford—Additions to Wards at Workhouse		C. P. Ayres, Architect, Burvale, Watford	—
Clitheroe—Roman Catholic Club		J. C. Howard Sandbach, Archt., 15, Richmond-terrace, Blackburn	—
Padiham—St. Leonard's National Schools		Thomas Bell, Architect, 14, Grimsshaw-street, Burnley	—
Ebbw Vale—Rebuilding Drydock Inn	Phillips and Sons, Ltd.	John J. Swallow, Architect, Steam Packet Chambers, Newport, Mon	—
Consett—Additions to House at Middles Farm		R. G. Moore, 5, Rosebery-terrace, Consett	—
Bradford—Industrial Hall at Cartwright Memorial Exhibition		J. Ledingham, F.R.I.B.A., & F. E. P. Edwards, A.R.I.B.A., Bradford	—
Chipstead, Surrey—Residence and Outbuildings		H. G. Gribble, Architect, Hill View, St. John's, near Woking	—

ELECTRICAL PLANT.

Ipswich—Lighting and Power Circuits	Corporation	Kennedy and Jeokin, 17, Victoria-street, Westminster	Aug. 27
Brierfield—Wiring, &c., St. Luke's Church		The Vicar, Brierfield, Burnley	" 29
Hackney, N.E.—Arc Lamps, &c.	Borough Council	Robert Hammond, M.I.C.E., 64, Victoria-street, Westminster	" 31
Radcliffe—Tramway and Lighting Feeders	Urban District Council	Lacey and Sillar, 2, Queen Anne's Gate, Westminster	Sept. 5
Worthing—Storage Battery Reconstruction	Corporation	Burstall and Monkhouse, 14, Old Queen-street, Westminster	" 7
Pietermaritzburg—Electric Tramway Equipment	Corporation	Morley and Dawbarn, 82, Victoria-street, S.W.	" 7
Stoke-on-Trent—Plant	Corporation	P. J. S. Tiddeman, Field-place, Stoke-on-Trent	" 11
Sydney—Generating Set	N.S.W. Railway Commissioners	The Agent-General for New South Wales, 9, Victoria-street, S.W.	" 12
Launceston, Tasmania—Electric Meters (500)	Corporation	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	" 29
Dublin—Electric Crane (100-ton)	Port and Docks Board	John P. Griffith, M.I.C.E., East Wall, Dublin	Oct. 5

ENGINEERING.

Devonport—Telescopic Gasholder	Corporation	Sidney E. Stevenson, Engineer, Gasworks, Devonport	Aug. 29
Kempston—Sinking Shallow Well	Urban District Council	Beesley, Son, & Nicholls, Engs., 11, Victoria-st., Westminster, S.W.	" 29
Southampton—Steam Rollers	Hants County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	" 29
Devonport—Cast-iron Main Gas-Pipes	Corporation	Stevenson and Burstall, Engineers, 33, Parliament-street, S.W.	" 29
Aberdeen—Widening Pocka Quay	Harbour Commissioners	R. Gordon Nicol, Engineer, Aberdeen	" 31
Haslemere—Pipelining	Hambleton Rural District Council	R. B. Grantham and Son, 23, Northumberland-avenue, W.C.	" 31
Exminster—Water Supply at County Asylum		E. H. Harbottle, County Chambers, Exeter	" 31
Belfast—Graving Dock	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast	" 31
Ennis—Water-Supply Works	Locatic Asylum Committee	Frank O'Connor, M.S.A., Ennis, Ireland	" 31
Hounslow—Steam Fire-Engine	Heston and Isleworth U.D.C.	H. J. Baker, Clerk, Town Hall, Hounslow	Sept. 1
Aberdeen—Points and Crossings, &c.	Harbour Commissioners	R. Gordon Nicol, Engineer, Aberdeen	" 1
Southampton—Pumping-Engines, &c.	Corporation	J. A. Crowther, A.M.I.C.E., 123 High-street, Southampton	" 1
Tooting, S.W.—Fire-Resisting Works at Fountain Hospital	Metropolitan Asylums Board	T. W. Aldwinckle and Son, Archts., 20, Denman-st., London Bridge	" 2
Aston, Birmingham—Reconstructing Tramways	Urban District Council	Robert Green, A.M.I.C.E., 37, Waterloo-street, Birmingham	" 3
Glasgow—Pumping Station, &c.	Prince's Dock Joint Committee	J. Deas, C.E., 53, Boswell-street, Glasgow	" 3
Tottenham, N.—Alterations to Hot-Water Supply at Hospital	Metropolitan Asylums Board	W. Hatch, A.M.I.C.E., Embankment, E.C.	" 4
Dunbeath and Latheronwheel—Waterworks		Jenkins and Marr, C.E., 16, Bridge-street, Aberdeen	" 7
Margate—Sea-Wall and Promenade at Newgate Gapway	Guardians	E. A. Borg, C.E., Borough Surveyor, Town Hall, Margate	" 7
Cannock—Laundry Machinery at Workhouse	Rural District Council	Willcox and Raikes, C.E., 63, Temple-row, Birmingham	" 8
Wrexham—Bridge and Road Alterations	Andover Rural District Council	T. Rees Evans, Highway Surveyor, Johnstown, Raabon	" 10
Longparish—Steel Girder and Concrete Bridge	Corporation	John Wormald, District Surveyor, South Cottage, Andover	" 10
Stoke-on-Trent—Water-Softening Plant		P. J. S. Tiddeman, Field-place, Stoke-on-Trent	" 11
Portsmouth—Pump Repairs	A. Holland Town Clerk, Town Hall, Portsmouth		" 14
Aulthea, Ross-shire—Pier at Aird Point	J. Mannors, M.I.C.E., 12, Lombard-street, Inverness		" 14
Pittentweem—Quay and Harbour Excavation	Town Council	D. and C. Stevenson, 84, George-street, Edinburgh	" 15
Talgarth—Waterworks	Hay Rural District Council	R. E. W. Berrington, M.I.C.E., Bank Buildings, Wolverhampton	" 16
Paddington, W.—Four Sweeping Machines	Borough Council	E. B. B. Newton, A.M.I.C.E., Sur., Town Hall, Paddington, W.	" 20
Jassy, Roumania—Waterworks	Corporation	M. Paiano, Engineer, Technical Office, Jassy, Roumania	" 22
Greenwich, S.E.—Four 5,000 H.P. Steam-Engines	London County Council	The Clerk, County Hall, Spring Gardens, S.W.	Oct. 6
Vauxhall, S.W.—Steel Superstructure of New Bridge	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Valletta, Malta—Lift Construction	Ministry of Public Works	The Receiver-General and Director of Contracts, Malta, Valletta	" 8
Cairo—Three Road Bridges over the Nile		The C. Intel. Branch, Board of Trade, 50, Parliament-st., S.W. (1904)	Feb. 1
Rochford, Essex—Boiler		J. Featherby, Bishop's Stortford, Essex	—

FENCING AND WALLS.

Nottingham—Hurdle Fencing	Public Parks Committee	Frank R. Lewis, City Architect, Guildhall, Nottingham	Sept. 4
Bordesley—Retaining Wall	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 10
Wigan—Boundary Walls at Cemetery	Burial Board	W. B. Johnson and Sons, Architects, 21, King-street, Wigan	" 26
Leeds—Fence Wall at Cookridge		Newsom and Gott, Surveyors, 3, East Parade, Leeds	—

FURNITURE AND FITTINGS.

Pontefract—School Furniture	Education Committee	W. Haddock, Clerk, Municipal Offices, Pontefract	Aug. 29
Kirkburton—Furnishing Storthes Hall Asylum	West Riding County Council	J. Vickers Edwards, County Architect, County Hall, Wakefield	" 29
Carlisle—School Furniture, &c.	Cumberland Education Committee	C. Courtney Hodgson, County Secretary, The Courts, Carlisle	" 31
Axbridge—Furniture	Guardians	A. Powell, A.M.I.C.E., 3, Union-street, College Green, Bristol	" 31
Etwell—Furnishing Isolation Hospital	Repton Isolation Hospital Committee	C. F. Chamberlin, Clerk, Union Offices, Burton-on-Trent	Sept. 3
Pudsey—Reseating Wesleyan Chapel, Church-lane		Danby and Simpson, Architects, 10, Park-row, Leeds	—

PAINTING.

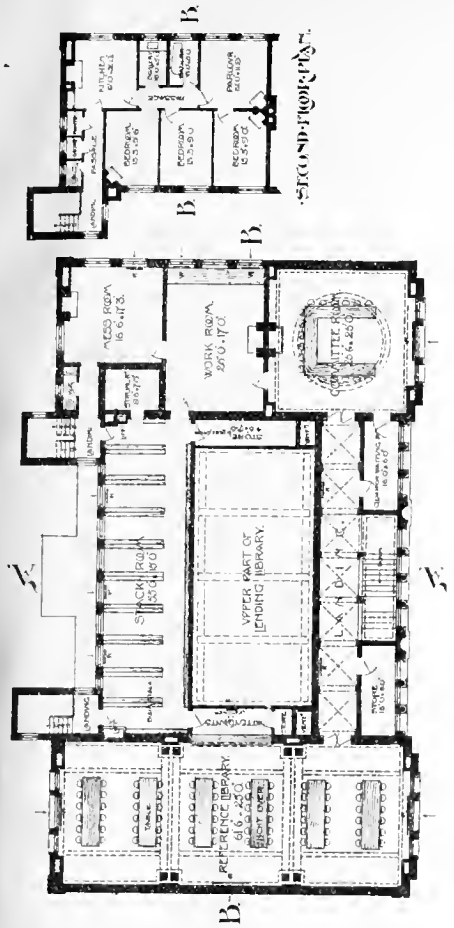
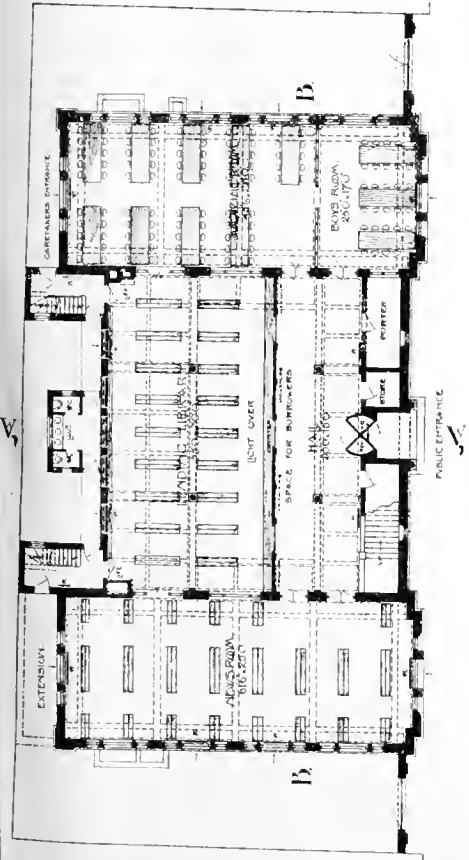
Harrow—Fire Brigade Station	Urban District Council	J. Percy Bennetts, Council Offices, Harrow	Aug. 29
Brierfield—St. Luke's Church		The Vicar, Brierfield, Burnley	" 29
Dunbar—House	Town Council	G. Fulton, Architect, 30, St. Andrew-square, Edinburgh	" 29
Boston—Cemetery	Burial Board	Millington and Simpson, Clerks, Boston, Lines	" 31
Manningham—West End Laundry, Wheatley Hill		J. W. C. Atkinson, Architect, 1, Ivetgate, Bradford	" 31
Earith, Hunts—Suspension Bridge	Huntingdon and Isle of Ely C.C.'s	Herbert Leete, County Surveyor, Huntingdon	" 31
Keighley—Temperance Institute		John Ellis, Solicitor, Compton Buildings, Keighley	" 31
Huddersfield—Lodges and Chapels at Edgerton Cemetery	Corporation	The Town Clerk, Town Hall, Huddersfield	" 31
Grimsby—Workhouse	Guardians	F. Winttingham, Clerk, St. Mary's Chambers, Great Grimsby	" 31
Pudsey—Twelve Houses, South Parade	W. Johnstone	J. Kendall and J. H. Bakes, Architects, Victoria-square, Leeds	Sept. 1
Carlisle—Twelve Houses, Margery-street		Johnstone Brothers, Architects, 39, Lowther-street, Carlisle	" 1
Leeds—Judges' Lodgings, Hyde-terrace	District Co-operative Society	The City Engineer's Office, Municipal Buildings, Leeds	" 1
Bury, Lancs—Library and Newsroom	Tramways Committee	The Educational Committee, 21, Market-street, Bury, Lancs	" 2
Halifax—Offices, Skircoat-road Depot	H. and W. Green	James Lord, C.E., Borough Engineer, Town Hall, Halifax	" 2
Bradtham—Two Houses and Offices	Corporation	J. Platts, Architect, High-street, Rotherham	" 2
Hull—Central Mission and Sunday School	Wesleyan Mission	A. E. Mathewman, Town Clerk, Town Hall, Bridlington	" 2
Manchester—Board-room and Offices	Guardians	Gelder and Kitchen, Architects, 76, Lowgate, Hull	" 2
Darlington—Red Lion Hotel	George White and Co.	A. J. Margatroyd, Architect, 23, Strutt-street, Manchester	" 2
Annan—Hospital Additions	Combination Hospital Directors	G. Gordon Hoskins, F.R.I.B.A., Court Chambers, Darlington	" 2
Ramsgate—Catholic Baptist Church		A. Tweedie, Architect, 43, Lady-street, Annan, N.B.	" 4
Dartford—School at Darent Asylum	Metropolitan Asylums Board	J. Wellden, 40 High-street, Ramsgate	" 4
Ravensthorpe—Congregational School		T. Dancombe Mann, Clerk, Embankment, E.C.	" 5
Ipswich—Borough Asylum		C. H. Marriott, Son, and Shaw, Architects, Dewsbury	" 5
		The Borough Surveyor's Office, Town Hall, Ipswich	—

PLUMBING AND GLAZING.

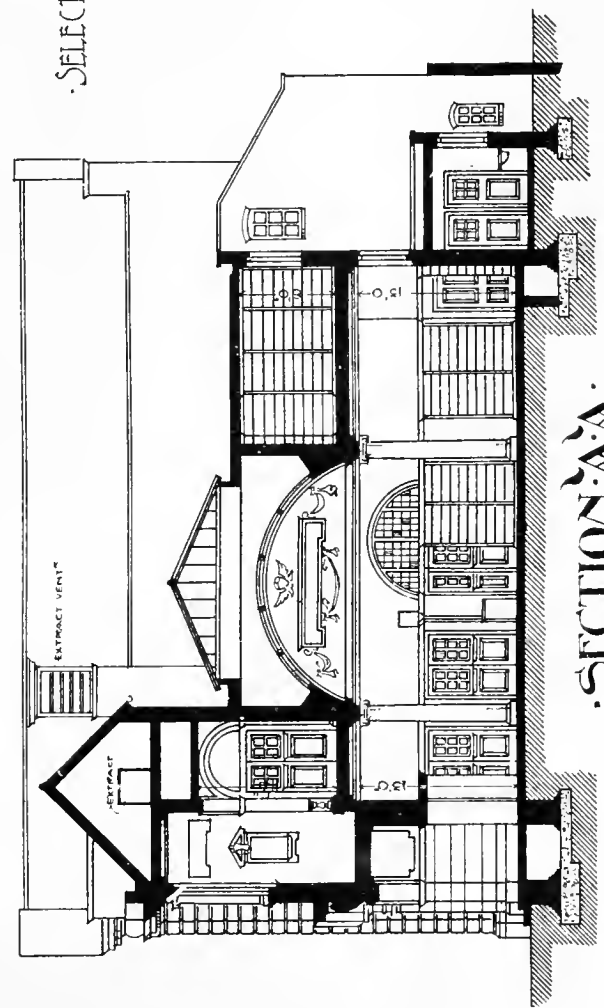
Dunbar—House	Town Council	G. Fulton, Architect, 30, St. Andrew-square, Edinburgh	Aug. 29
Wickham Market—Leadwork Restoration at Church		John S. Corder, Architect, Wimbourne House, Ipswich	" 3

ROADS AND STREETS.

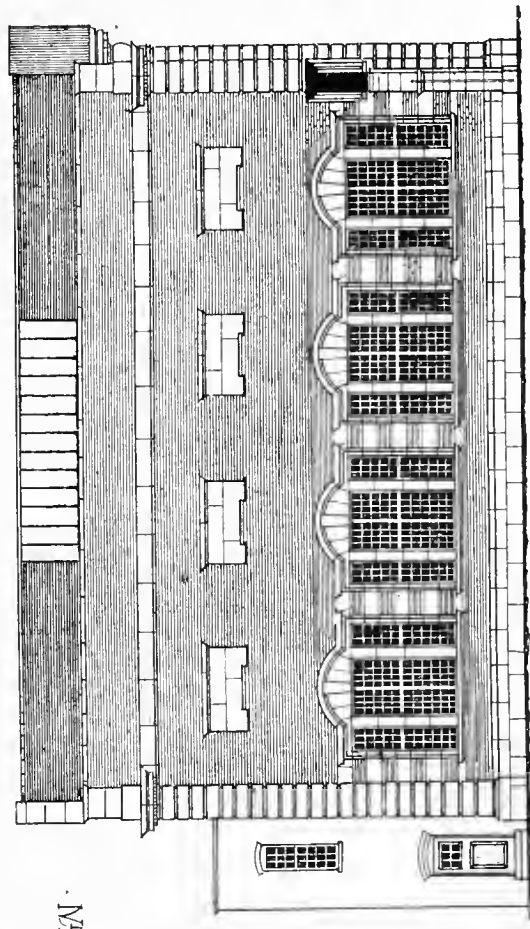
Harrow—Making-up Private Streets	Urban District Council	J. Percy Bennetts, Engineer, Harrow	Aug. 29
Swindon—Making-up Rosebery-street	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	" 3
Falkirk—New Street, Lint Riggs		D. Ronald, Burgh Engineer, Burgh Chambers, Falkirk	" 3
Swindon—Making-up Maidstone-road	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	" 3
Halifax—Private Improvement Works	Highways Committee	James Lord, C.E., Borough Engineer, Town Hall, Halifax	" 3
Kettering—Completing Private Streets	Urban District Council	T. Reader Smith, Surveyor, Market-place, Kettering	" 3
Swindon—Making-up Graham-street	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	" 3
Plymouth—Making-up Streets and Lanes	Corporation	James Paton, Borough Engineer, Municipal Offices, Plymouth	" 3
Swindon—Making-up Ashford-road	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	" 3
North Shields—Paving Works	Tynemouth Corporation	John F. Smillie, Borough Surveyor, North Shields	Sept. 1
Needham Market—Concrete Paving Works		H. Miller, M.I.C.E., 16, Museum-street, Ipswich	" 1
Esber—Making-up Private Street	Urban District Council	E. A. Everett, Clerk, Portsmouth-road, Thames Ditton	" 1
Hove—Wood Paving George-street and Church-road	Corporation	H. Endacott, Town Clerk, Town Hall, Hove	" 1
Middleton—Private Street Works	Urban District Council	Frederick Entwistle, Town Clerk, Town Hall, Middleton, Lancs	" 1
Felling—Paving Streets	Urban District Council	George Bolam, Clerk, Council Buildings, Felling, Co. Durham	" 1
Claygate—Making-up Station-road	Urban District Council	E. A. Everett, Clerk, Portsmouth-road, Thames Ditton	" 1
Exeter—Roadway		Ellis, Son, and Bowden, F.S.I., Surveyors, Exeter	" 1
Brixton, S.W.—Road		Edward Millard, Surveyor, 1, Finsbury-circus, E.C.	" 1



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SELECTED DESIGN



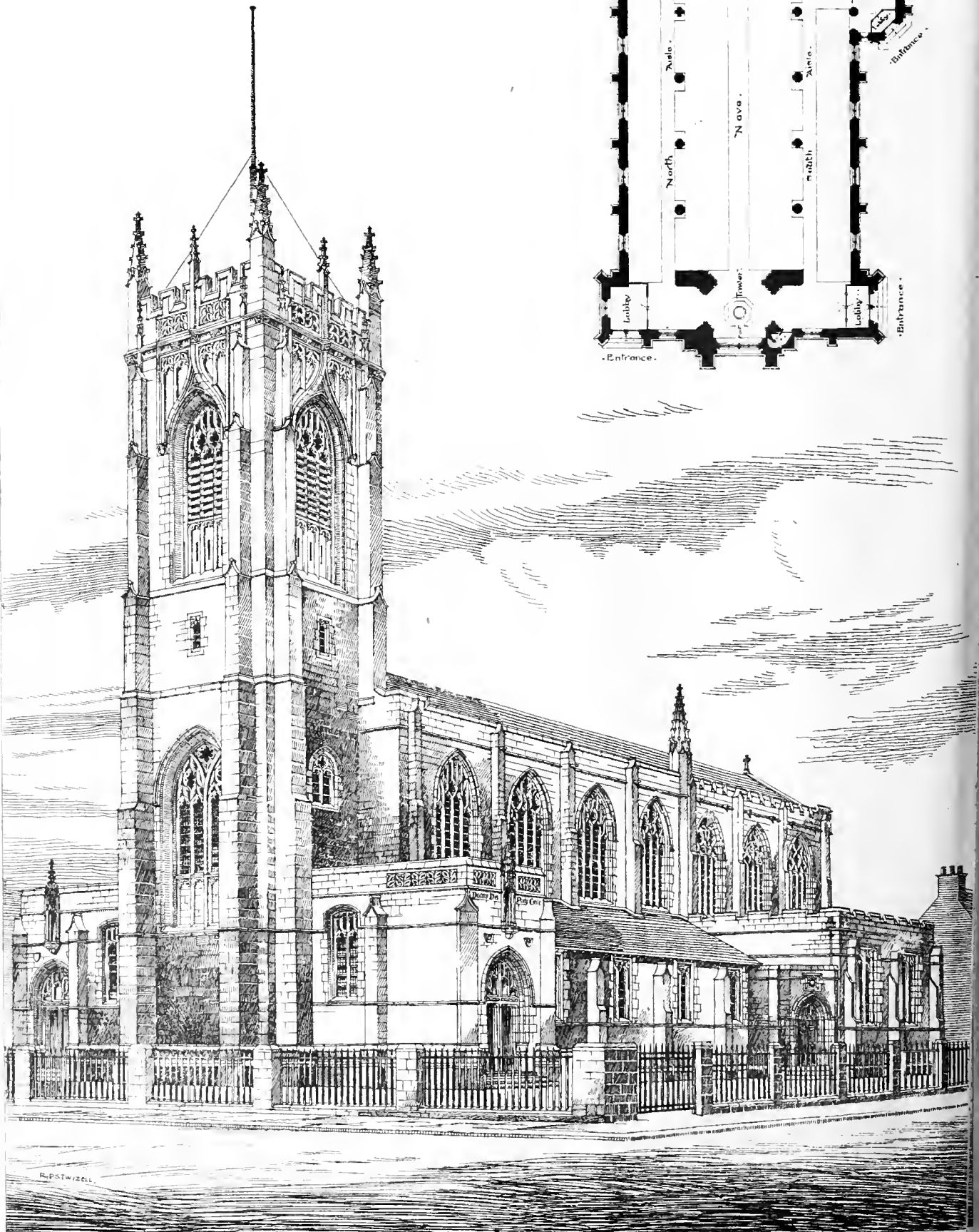
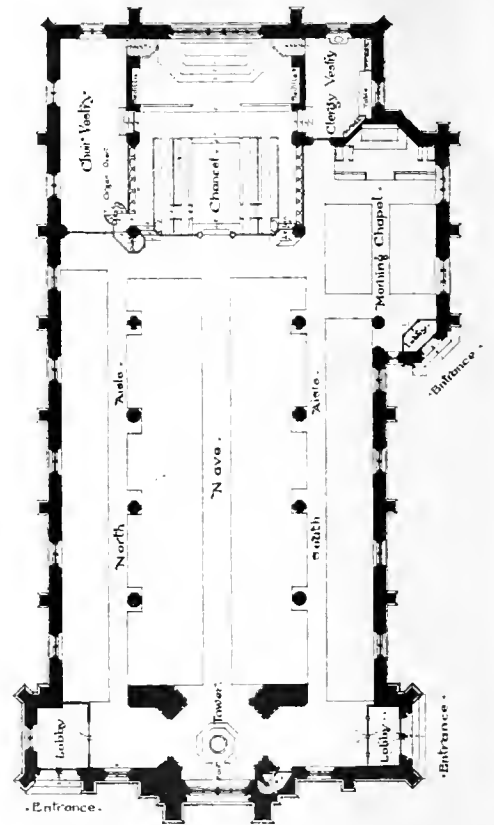
SIDE ELEVATION

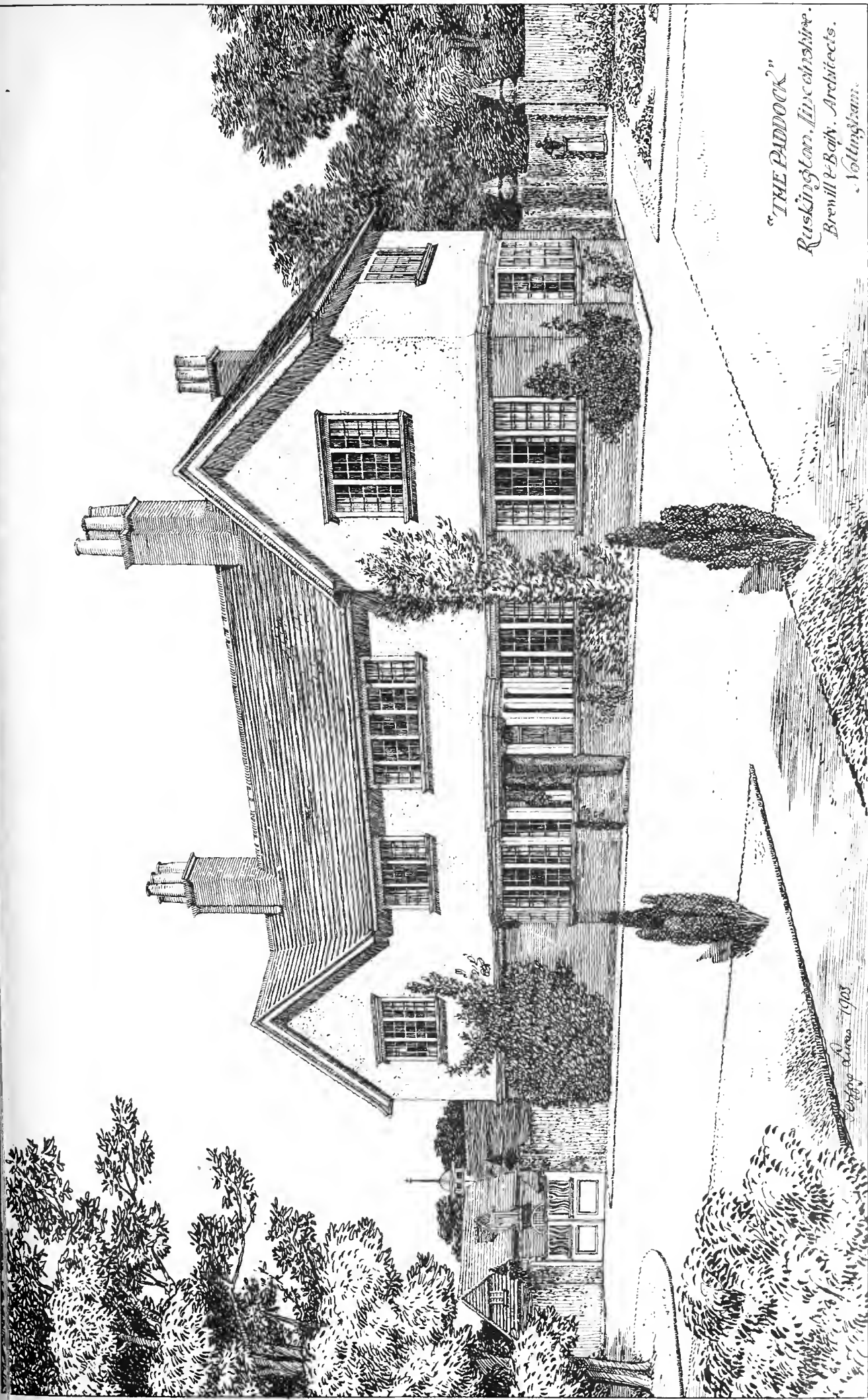
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CHURCH OF ST OSWALD.

WEST HARTLEPOOL. *Hicks and Charterwood, Architects.*
Newcastle-on-Tyne.





"THE PADDOCK"
Ruskington, Lincolnshire.
Brenill & Baily, Architects.
Nottingham.

Oct 1893

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXXXV.—No. 2539.

FRIDAY, SEPTEMBER 4, 1903.

DESIGN AND SUPERINTENDENCE.

THE two main divisions of architectural practice—Design and Superintendence—have been inseparable functions ever since the profession emerged from the earlier vocation of the master-craftsman. These functions have grown up together. But, as a matter of fact, there is little in common between them. The man who makes a design and prepares drawings may be an expert at his vocation, a thorough artist, and yet not feel himself the right man to supervise the execution of the work. The two duties have been associated because it appears to be right that the designer is the only person to judge of the execution of his own ideas, or their realisation in brick and stone or wood; the practice also is a healthy one, inasmuch as it brings the architect into contact with his work, and as long as he is in touch with the trades he is more likely to remain practical in his design. To separate design from the actual building is to dissociate the motives and aims of the artist and the builder or craftsman, and to produce a spirit of antagonism between them. It will be a bad day for architecture when the union between the artist and the craftsman is broken. For a century or two architecture and allied arts have been estranged in a greater or less degree, but of recent years the estrangement has become much less acute; the artist is now on friendly terms with those who execute his design; each tries to learn something from the other; there is more sympathy in their motives, and both are brought together in the art and technical schools. These influences have been gains. On the other hand, there is just now a tendency among many of the followers of architecture to make it more of a profession independent of the operative part of the vocation, to regard it as a business agency or a purely artistic vocation, just as the claims of business or art are the more pronounced. A large firm may appropriately style themselves the "Architectural Design Supply Association" who would undertake to supply designs and drawings for buildings; another the "Architectural Building Syndicate," which would undertake to carry out any approved design at the lowest market price. Such wholesale businesses would ignore altogether the executive or craftsmanship side of architecture; the art, indeed, would be regarded simply as a business. And yet many of our large private firms in London and the chief provincial towns are really professional concerns of this kind. They try to absorb all the architectural work, no matter of what kind, and go in for surveying and valuation and estate development as well, and also obtain tenders from builders at the lowest rates. In businesses of this kind superintendence is quite a subsidiary matter. The young pupils may be occasionally allowed to go over works in progress for their own benefit and instruction, and a member of the firm may pay an occasional visit to the building, so as to be able to claim the customary 2½ per cent. for superintendence. This commercial business view of the profession is not favourable to the twofold function of the architect. It would confine the profession simply to the design and preparation of drawings at a certain percentage on the cost. By confining the architect's attention to design only, his labour and responsibility would be much reduced—an important point with those who wish to make the business an easier and less

irksome one. A great many successful architects who have a large practice appear to be of this way of thinking, for they practically leave the superintendence of their buildings to clerks of works, and seldom trouble about personally verifying the work or materials employed. No doubt also the desire to increase their commissions has been instrumental. An architect cannot take a large and varied practice and at the same time find it convenient to superintend his buildings properly. It is impossible. The duty of superintendence must devolve on someone else, with a certain loss to the integrity of the design. The result is unfortunate for art. There are many buildings of good design marred by negligent superintendence and bad detail. The complexity of the conditions under which architects work has also tended to limit his work in one direction. The development of specialism is one of the causes. The prevalent opinion is that better work is done by a man confining himself to one branch of the profession. The designer of buildings is generally a good draughtsman, and if he devotes himself to the drawing of plans and elevations, he soon becomes an expert, and may get plenty of this kind of work to do if he confines his attention to it. Yet it is questionable whether the designer who sticks to his drawing-board is so masterful in expedient and detail, or so practical in his drawings, as he who has had some experience in the workshop, and is in the habit of superintending his own buildings. We do not think he can be. The draughtsman who knows little of workshop practice, or the framing of timber roofs, cannot be so resourceful as the man who has seen different kinds of roof actually framed. In stonemasonry and brickwork possible modes of getting over difficulties in jointing or bonding can only be learned from experience on actual building. The experience gained by seeing things actually done widens the mind of the designer; he becomes more practical in avoiding impossible methods, at the same time bolder in making his details conform to actual requirements. Again, the mere draughtsman working in a narrow groove cannot fail in repeating mistakes in construction and detail. He can only learn to discard them by comparing his detail with practical work, and seeing what really can be done. We can only perfect ourselves in design by learning the possibilities of construction and treatment. These are strong reasons for believing that a knowledge of practical work, which superintendence of buildings will enable the architect to obtain, is of great assistance in design, and that an architectural designer or draughtsman so equipped is in a far better position than a man who picks up all his knowledge of detail in an architects' office or a classroom. Artistic draughtsmanship is not identical with architectural designing; the former implies an artistic sense of eye and touch; the latter a knowledge of construction as well as architecture. We may, therefore, affirm generally that the two functions of the architect's work—the designing of buildings and their superintendence—are essentially necessary to the proper performance of the work, and that we cannot separate one from the other without a distinct loss to the profession and to the building.

These remarks are almost called for at a time when there is a desire on the part of some of the younger men in the profession to discount the practical duties of their calling. They entertain a dislike for the manual part of the art, as it involves technical knowledge and tool manipulation, which is rather repugnant to them. And there is a reciprocal feeling of dislike among workmen for any interference with their work from those who prepare drawings without any practical knowledge of the trade; and this reciprocal feeling has made a stronger

cleavage between the two branches of the profession. These two aims are represented in the Academical or Traditional and the New Craftwork schools, which witness to the separation: the intensity with which tradition has been followed has created the opposite school of the New Craftsman. So it will always be. What does the teaching of architecture itself say? That there was always a connection subsisting between the designer and craftsman. They were often the same individual, exercising a dual control over the work. With the profession of to-day there is an inclination to separate these two duties, to make the designing of buildings, the preparation of drawings and specifications, a duty apart from the superintendence which follows. One reason is the marked division between the design on paper and the actual building intrusted to the contractor. The very mode of remunerating the architect favours the distinction. Each part of his work has a percentage assigned to it. It is now a common practice to engage an architect to prepare a design or a scheme for building without any intention of realising it. Competition work is an instance. Drawings and perspectives are made for a building at the invitation of a committee; it may be executed or not, but the execution is not a condition of the contract; it is only the merits of the design that are thought of; the execution may even be intrusted to another. It might be otherwise if the terms of competition were a prize for the best building, or for the ablest builder who had carried out the most satisfactory work, instead of for the best design on paper. So that modern competition has greatly assisted in the cleavage between the two. The only sort of rivalry in the great epochs of art was that between art craftsmen—sculptors, painters, carvers, metal-workers—who strove to vie with each other in the beauty and excellence of their handiwork. It was the actual work that was the object of reward, not the drawing for it. When we apply the same principle to the superintendence of our modern buildings, we shall see at once where it lacks the reality of the old influence. Efficiency of control can only be exercised when the architect supervises the process of execution from the earliest stage in the conversion of material to the final result. To do this he must have access to the workshops of the builder, direct the economical cutting of stone from the block, and the stone dressing, the formation of joints, of various labours on the stone for cornices, copings, stairs, and various other purposes. In the same manner in the carpenter's trade effective superintendence begins at the timber yard, on the selection of proper timber, on its seasoning, on the mode of setting-out and framing roofs and floors, in superintending the proper joints for framing, and the various processes necessary in the construction of floors, roofs, and partitions. Also to the many processes of joinery, which includes under that general title all the finishings of the woodwork of a building, everything which is thickened, planed, and wrought to a smooth face, and framed with a precision and neatness which should render it almost impossible, but for the grain and colour of the wood, to discern the joints of the framing. The ordinary idea of superintendence is to see that the specified kind of fir or deal or oak is used, and that they carry the right thickness, that the workmanship looks fairly good, that there is no sapwood or shrinkage on floor boards or framed work; but these are only superficial signs, and such superintendence cannot reveal the actual jointing which may be concealed, or many other defects which the tricks of the trade disguise. The actual workmanship may be hidden from the architect's view. In the building of stonework in piers and columns, cornices and staircases, how very little is disclosed to his examination. The cores of columns and cornices may be defective without the proper

bonding or "anchorage," and yet they may pass the specification standard superficially, and be in accordance with the dimensions and external section of the details. How can the architect tell whether the pulley stiles of the sash-frames are according to specified thickness, or the outside and inside linings are what they appear to be when the frames are fixed to the openings? An eighth of an inch less would not be recognised; they are allowed to pass. How often, for instance, specified 2in. deal moulded sashes are finished as 1½in., unless great care is exercised, and the floor-boards do not agree with the finished thickness specified? The allowance made for planing has not been taken into account, and the doors and other framings are an eighth of an inch less in thickness than they were intended to be. How, again, is it possible, when a shop cornice is up, to find out how it is put together—whether properly tongued and grooved. With such things as French and other casements, the casual visit to a building cannot satisfy the architect that the water-bars of brass or iron, as specified, are used, and whether the proper weather grooves and rebates are made. These are things which can only be ascertained by frequent visits to the workshop of the joiner. But what does superintendence, as generally understood, imply? It means a periodical visit to the building in progress, where a great deal of the mason's and carpenter and joiner's and others' works are already fixed or in process of fixing, the actual workmanship being done at the builders' shops. The architect sees only, in most cases, the finished work fixed, after it is too late for alteration. His general superintendence takes the form of a walk through the building with the builder or foreman: a superficial inspection of the several trades with reference to the specification requirements; an occasional alteration about some matter of detail which often leads into a charge for "extra"; an alteration here and there. But such is not in any sense superintendence. Those who have given any consideration to the question will have a rather different opinion. One American critic says the superintendent of a building, whether the "architect himself or someone under him, should visit the work," specification in hand, checking off one by one the items in regard to labour and materials which he positively knows by the evidence of his own senses to have been strictly complied with. We should not like to say how many there are in the profession who can assert that they know by the evidence of their own senses how such-and-such a thing has been done. The only way is to watch the process of the work day by day. The same writer gives a few hints which the superintendent of a building may follow, but the advice rather applies to the clerk of works. First, he should be familiar as possible with the plans and other drawings of the building; he must foresee the consequences of each step during construction; he must not trust blindly to the accuracy of the plans, as mistakes in drawing or figuring cannot be avoided; he should compare the work on the ground and bring to the notice of the architect any error in the drawings or figuring which he discovers; he should compare figures with each other, details with general drawings, and facilitate to the utmost the smooth and rapid prosecution of the work committed to his charge; he should also look out beforehand for other points which may affect or hinder the construction. "If, for instance, the drawings show stone and brickwork bonded together in elevation, it should be his duty at once to procure bricks of the kind to be used in the facing, and lay them up with mortar joints of the specified width, in order to ascertain with certainty the height which a given number of courses of bricks will lay. It is common to assume that five courses of bricks will lay 1ft. in height [in this country four courses are taken to the

foot], and the detail drawings for the stonework are figured accordingly. If, then, as often happens, the particular brick used is a little thicker or thinner than the standard, the stone once cut from an incorrect assumption will fail to bond properly, and if it cannot be recut, must either be thrown away or inserted as best it may, the wide joints and irregular lines bearing witness to the incompetency of the director of the work." The superintendent will find many opportunities for saving both contractor and owner from the carelessness of workmen. The inspection of materials delivered, and the rejection and removal from the works of defective materials, are cautions of importance. The building should be visited periodically, and examined throughout at each visit. In this way concealment of bad workmanship or material can be better discovered. These remarks apply to clerks of works even more than to the architect, but they are all to the point. The latter cannot visit the building so frequently as to find out all that has been done during his absence; but he can try by frequent calls at the workshops to keep pace with the processes of the trades, and discover faults before it is too late to rectify them. Mere casual visits and superficial examinations is not superintendence in the true sense of the word. Nor will it do to trust to specifications as if they embodied all that is necessary in construction; there is more that cannot be touched in a formal document, which only prescribes materials and sizes. The detail drawings may also be incorrect, as actual requirements can only be obtained during construction. Too much confidence is also placed in the workman who is paid by a contractor, and does not care to divulge defects, and has an inveterate dislike to pull down or alter work he has already done. A great deal more could be said about the various devices and expedients of building workmen to conceal points that are of the greatest importance; but we may leave a few of these matters to another article.

PROPOSED AMENDMENTS TO THE BUILDING ACT.

THERE are many sections of the London Building Act, 1894, which call for revision and improvement. We have from time to time pointed out a few of the more questionable sections of the Act relating to fire prevention and the safety of occupants. The present sections were framed with the object of partially acceding to the demands which experience had shown to be desirable, of bridging over in a temporary manner the difficulties and inadequacies of the old Act; but they still leave much to be done to render the statutory law simple and direct in its action. Several suggestions have been made. Mr. Bernard Dicksee, district surveyor, in his paper on "Fire-Preventive Sections of the Building Act" prepared for the late International Fire Prevention Congress, deals with the fire sections of the Act and their effect on building in London, and offers a few useful suggestions for the amendment of the law. We may briefly refer to some of these. One of the most far-reaching sections of the present Act is that on the Separation of Buildings (74). The present section (2) provides that in any building over ten squares in area, used in part for trade or manufacture and in part as a dwelling-house, the former portion used for trade, &c., is to be separated from that used as a dwelling-house by walls and floors constructed of fire-resisting materials, together with all passages, staircases, and other means of approach to the latter. The part used for trade or manufacture, if it extend to more than 250,000c.ft., is to be subject to the provisions relating to the cubical extent of buildings of the warehouse class. This section has been often

contested in courts of law, owing to the difficulty of determining the conditions, as in defining the meaning of trade or manufacture and the area; in one case the question turned on the point as to whether premises in which beer was sold came under the section or was exempt from it. It is a most important section, for it prevents a large building over ten squares in area from being used both for trade and as a dwelling-house without due provisions being made for the safety of the occupants in case of fire; yet, as we have pointed out, the statutory area of ten squares is arbitrary, and excludes a large number of buildings which are now used for manufactures of an inflammable kind, and also for tenements which just come below the limit of area. The amended form suggested by Mr. Dicksee is to the following effect:—

"(1) Every building exceeding ten squares in area, and used, or constructed or intended to be used, jointly for the purposes of manufacture or trade (whether wholesale or retail), and for dwelling, shall be structurally divided into a part or parts to be used for the purposes of manufacture or trade and a part or parts to be used for dwellings. (2) The part or parts used for the purpose of manufacture or trade shall be separated from the parts to be used for dwelling by walls and floors constructed of fire-resisting materials, and all such walls shall be at least 4in. in thickness, and if more than 10ft. in height and not built in cement at least 8½in. in thickness." It is also provided that all the openings in such walls and floors are to be closed by doors and frames of fire-resisting material bedded solid to the wall or floor; also the part, or parts, used for dwelling shall have a separate means of approach from street or open space, and all staircases and passages forming the means of approach shall be included within the parts used for dwelling, and be constructed of fire-resisting materials. Practically the present section is recast. Sub-clause 2, which runs: "And all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of fire-resisting materials," is made less obscure, for the amended clause states there shall be provided to the parts used for dwelling a separate means of approach from a street or open space, and the staircase and passages are to be included within the dwelling. In fact, the dwelling is to have its own approaches, staircase, &c. As it now reads, these may partly belong to the part of building used for trade, &c. Mr. Dicksee would substitute for section 74 (1) the following:—" (1) Every building shall be separated from each of the adjoining buildings by external or party-walls, or by party-arches or party-floors. (2) If any building exceeding ten squares in area is divided into two or more tenements, each having a separate entrance and staircase, or a separate entrance from the outer air, every such tenement shall be deemed a separate building, and shall be separated accordingly." These clauses define in a rather more lucid manner than the present section, which runs: "Every building shall be separated either by an external wall or by a party-wall or other proper party-structure from the adjoining building (if any), and from each of the adjoining buildings (if more than one)."

As regards the separation of tenements within a building, the present section provides that in every building exceeding 25 squares in area containing separate sets of chambers or rooms, tenanted or constructed to be tenanted by different persons, the floors and staircase are to be fire-resisting. The amended clause suggested insures that each separate set of dwelling-rooms tenanted, or adapted to be tenanted, in different occupations are to be cut off from each other by fire-resisting walls, partitions, and floors, and from the common staircase or other approach by brick walls. It will be

seen this is a more complete separation than that prescribed in the Act; but these precautions are provided only for buildings exceeding 100,000c.ft. Section 68 is also amended. In fact, each separate dwelling virtually is protected by walls and floors of fire-resisting materials, and the corridors, landings, and stairs of the common staircase approach are to be of the same kind. The amended form also proposes that a building of more than 250,000c.ft. is to be divided by party-walls, no division extending to more than that limit, each to have a separate staircase and entrance, affording a direct means of approach from each set of dwelling-rooms to the street. These clauses will prevent the occupation of any large block of tenements for dwellings without means of approach that is above suspicion. A similar clause now exists (section 75), which provides that no building of the warehouse class shall extend to more than 250,000c.ft. unless divided by party-walls, and no addition is to be made to any building of this class which will extend it beyond this cubic space; but the limit of 100,000c.ft. is now suggested for buildings of this class, the floors of which are not of fire-resisting construction. The suggested clause extends practically the same provision to buildings of the warehouse class. Buildings exceeding 100,000c.ft. containing offices or rooms not used for dwellings, tenanted by different persons, and to those of more than 250,000c.ft., these are to have, in the first instance, floors, staircases, and corridors of fire-resisting materials, and carried on supports of the same kind, and the latter party-walls with separate stairs and entrance, as in the case of dwellings. These latter clauses will apply to all buildings let as offices of the dimensions named.

The rules as to uniting buildings (section 77) are very important, and are intended to prevent buildings in different occupations from being united. The Act says they are not to be united except when they are wholly in one occupation or are adapted to be so, and it goes on to describe the openings in party-walls. Sub-section (b) states such openings shall have the floor jambs and head formed of brick, stone, or iron, and be closed by two wrought iron doors each $\frac{1}{2}$ in. thick on each side of the wall, fitted to rebated frames without woodwork of any kind (or by wrought-iron sliding doors, &c.) The suggested clause inserts after brick, stone, or iron, "or other fire-resisting and non-combustible material, and shall be closed by a pair of party-wall doors at a distance from each other, of the full thickness of the wall." These words will admit other fire-resisting materials than those mentioned being used, such as concrete, uraltite, and other substances; it also speaks of the doors being fitted close to rebated iron frames, and secured by bolts at the top, middle, and bottom of each stile, &c., so as to prevent the risk of warping under the heat and the escape of fire and smoke into the adjoining building. The clause also allows the use of doors of fire-resisting material other than iron. Other details are suggested: one that the Council have power to allow the openings to be constructed not exceeding 9ft. wide. Another clause refers to openings in party or external walls subsequent to existing openings, in which case the subsequent openings are to be made in accordance with the provisions of the Act. For any openings made before the passing of the amended Act, the owner or occupier is to make an application for a certificate as to such openings, stating their size, number of stories, use and area of building. These suggestions are good. One other point is the limit of cubical contents suggested for trade premises. Mr. Dicksee proposes, as we have seen, a limit of 100,000c.ft. for buildings of the warehouse class, the floors of which are not constructed of fire-resisting materials;

but where the floors are so constructed the building or division may extend to the statutory 250,000c.ft. The existing section 75 certainly errs on the side of leniency. The suggestion made as to the protection of metal girders, stanchion columns, and supporting walls and floors by incasing them with concrete, terracotta, or metal lath-and-plaster is a necessary one; also the one condemning wooden boarding or panelling to partitions, walls, or ceilings not of fire-resisting construction; that the spaces between the studs or joists be filled in solid with brick, concrete, or other fire-resisting material, and that no space should be left between such panelling and the wall partitions, &c. There are other suggested clauses to which we may refer another time. There is certainly much to be done to make the present Act conform to our present knowledge of fire-resisting construction, and the best means of fire prevention. The sections as they stand bear witness to the tinkering of old Acts and sections. We ought to have now a code of building rules that are at once comprehensive, simple, and decisive in their operation, applying to every class of building and up to date. Sections 74, 75, 77 are instances of revisions and interpolations of the older Act, which are by no means satisfactory, and are constantly giving rise to disagreements. The importance of limiting the cubical contents of a building in which separate sets of dwelling-rooms exist is too obvious to admit of question. One hundred thousand cubic feet is certainly quite large enough capacity in a building to contain dwelling-rooms in different occupations constructed in the usual manner without fire-resisting partitions, floors, stairs, and approaches. Beyond that cubical limit, they ought to be separated partly vertically by walls and partly horizontally by floors of fire-resisting construction, as in the manner suggested; but beyond the limit of 250,000c.ft., now prescribed for buildings of the warehouse class, the divisions ought to be by party-walls carried up between the sets of dwellings, as a fire is better confined between vertical walls than in spaces limited in part by floors and in part by partitions. The author has obviously considered this necessity in the suggested clauses. In buildings containing sets of offices other than dwelling-rooms a similar arrangement is provided. In both cases it is essential that the common staircase and approaches should be inclosed within brick walls of at least one brick in thickness, and the floors of corridors and passages be also invulnerable to fire. Where such provisions are made compulsory the risks of fire with the attendant loss of lives will be very materially lessened in all our buildings exceeding the limit of 100,000c.ft. A very large proportion of buildings in London are used partly for trade and partly as a dwelling-house, and come within the ten-squares area, or exceed it more or less. The existing law provides for them by walls and floors and approaches of non-combustible character where they exceed ten squares; but a great deal is left to the discretion of the authorities, and as for those which fall within the limit, we have no guarantee at all.

THE ARCHITECTURAL ASSOCIATION.

THE curricula of the Day and Evening Schools of the Architectural Association have just been published. The classes are now held, as for many years past, at 56, Great Marlborough-street; but after Lady Day, 1904, the work of the Association will be carried on at the Royal Architectural Museum in Tufon-street, Westminster, where the necessary alterations are in progress, from plans by Mr. Leonard Stokes, F.R.I.B.A. The Day School will be under the mastership of Mr. H. P. G. Maule, who has been appointed this session in succession to Mr. A. T. Bolton. The winter session will begin on Monday, the 28th inst. The evening schools, at which the lecturers and instructors are Messrs. Cole A. Adams, Henry

Adams, Max Clarke, A. O. Collard, Banister F. Fletcher, P. L. Forbes, J. E. Hulme, H. J. Leaning, W. G. B. Lewis, F. W. Pomeroy, H. B. Ransom, H. A. Satchell, H. Stannus, C. E. Varndell, and A. M. Watson, will also open on the 28th inst.

The following is the syllabus for the ordinary meetings of the Architectural Association, held, as in former years, on alternate Friday evenings at 7.30 (and until March 25, 1904) at the R.I.B.A. room, 9, Conduit-street, W.:—

- Oct. 2. Annual Meeting. Address by the President, Henry T. Hare, and Distribution of Prizes.
- Oct. 16. "The Day School in Relation to Architectural Pupilage," by Arthur T. Bolton and H. P. G. Maule.
- Oct. 28 (Wednesday). *Conversations* at the Royal Institute of Painters in Water Colours. 8 p.m.
- Nov. 6. "Modern Churches," by C. A. Nicholson.
- Nov. 20. "Farm Buildings," by H. M. Cantley.
- Dec. 4. "Photography for Architects," by Members of the Camera and Cycling Club.
- Dec. 13. "Old Stucco and Plaster Work, with Reference to Modern Possibilities," by G. P. Bankart.
- Jan. 8, 1904. "Egyptian Architecture," by Hugh Stannus.
- Jan. 22. "As to the Making of Architects, with Examples of Draughtsmanship," by Maurice B. Adams.
- Feb. 5. "Cottage Homes," by W. A. Harvey.
- Feb. 19. "Corner Houses," by W. Henry White.
- Mar. 4. "Schools," by John W. Simpson.
- Apr. 22. "Craftsmanship," by W. Gilbert.
- May 6. "The Value of Science as an Architectural Curriculum," by A. E. Muaby.
- May 13. Members' Supper.

THE ENGINEERING STANDARDS COMMITTEE.

A REVIEW of the work of the Engineering Standards Committee has been issued by the secretary, Mr. Leslie S. Robertson.

The movement was set on foot in the beginning of 1901, when the five leading technical institutions, the Civil Engineers, Mechanical Engineers, Naval Architects, Iron and Steel Institute, and Electrical Engineers, supplied funds and formed committees in order to introduce into this country a national standardised system, and thus bring British manufacturers into line with their American and German rivals. The work grew enormously, and the Government, recognising its national importance, made a grant of £3,000 towards the expenses, and now the leading manufacturers are also subscribing to the support of the Engineering Standards Committee. No fewer than 27 committees have been at work during the past three years, with 170 members, including 25 representatives of Government departments.

Referring to the committee on bridges and general building construction, presided over by Sir Benjamin Baker, the report says that their labours have been confined principally to drawing up a series of standards so as to meet all the requirements of general building construction, and they have succeeded in making a considerable reduction from the large number formerly in vogue, and some of the leading firms are already adopting them.

In the matter of tramway rails the sub-committee have agreed upon a series of standards which have been approved by the Board of Trade, and have even been rolled abroad; and the report of the sub-committee on railway rails is nearing completion.

The standardising of electrical plant is presided over by Sir William Preece, and four sub-committees have been doing a lot of useful work. The sub-committee on generators, motors, and transformers have been collecting evidence for the determination of standard voltages and frequencies, and also the standard sizes for dynamos and motors. The other electrical committees deal with such subjects as cables and conduits, telegraphs and telephones, and the temperatures of insulating materials.

The Indian Government appointed a conference to discuss the question of standard types of locomotives, and they have referred some of their findings to be dealt with by the Engineering Standards Committee. It is anticipated that great advantage will be gained by the interchangeability of the different parts of locomotives, the object being to enable the British manufacturers to deal with the Indian orders and deliver the material more quickly, an advantage hitherto held by Americans and Germans through their system of standardisation.

The endeavour of the Shipbuilding Committee has been to decide upon a series of sections which would give sufficient graduation and yet not be larger than could possibly be avoided, so as to reduce to a minimum the plant and stock of rolls

to be kept by the steel-makers. This committee has also been discussing the sizes of test pieces for iron and steel material used in the construction of ships and their machinery.

The French Government have sent over a commissioner to study the procedure and the lines upon which the Engineering Standards Committee had been organised.

ON BUILDING TIMBERS.—XXXV.

OAK.

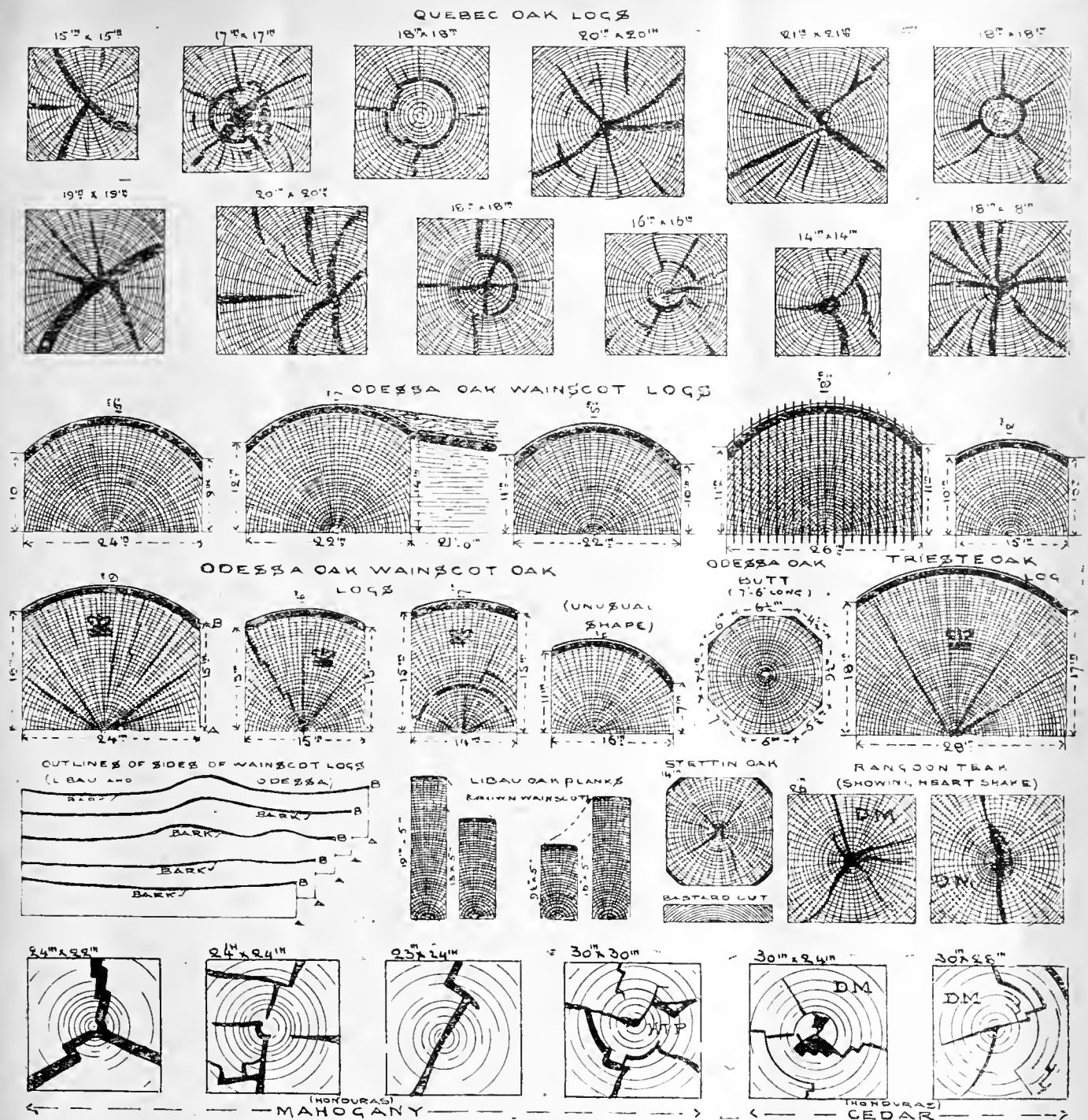
ENGLISH oak was commonly used for tiling-battens in this country, until sawn pine battens, introduced from Norway and Sweden, displaced them. Tiling-battens were called "laths" when oak was used, and the old specifications described laths of three kinds—viz., heart of oak, sap laths, and deal laths: the heart-of-oak laths were used for tiling, the others for plastering. Before plastering laths were imported ready sawn—that is, when they were cleft from lath-wood—some architects applied the old terms in use for oak laths to those split from Baltic lath-wood; hence in some specifications the ludicrous expressions, "heart-of-deal laths" and "sap laths" are sometimes found! The old architects rigidly excluded oak sapwood from all wood cleft into roofing "battens," but their modern successors are content to use pine sapwood for roofing and plastering. Split deal laths were used at one time for ceilings only, and oak sap laths for covering wall studding and partitions. All these laths, as well as the heart-of-oak laths for tiling, were cleft to 1½ in. broad and ½ in. thick. The "statute" (for everything in building was at one time regulated by Act of Parliament) recognised but two sorts of laths—viz., "five-foot laths" (five score to the hundred) and "four-foot laths" (six score to the hundred). These were made up in bundles, a bundle being a "hundred." Though the statute did not acknowledge it, there was another lath made, one 3 ft. long, of which size there were seven score, or 140, of these to the "hundred." It requires no very elaborate calculation to discover that 500 ft. lineal of five-foot laths, 480 ft. of four-foot laths, and 420 ft. of three-foot laths made each one "hundred" or one "bundle." It would naturally be expected that some trade custom would tone down any very rigorous application of mathematics to these laths, and this really was so, for a "bundle of laths" never exactly corresponded to the description in width, thickness, tale, or measure of the pieces composing it. Thirty bundles of five-foot made a "load," thirty-seven and a half of 4 ft., and fifty of 3 ft. The old lath-renders in oak called a radial cut or split the "cleft grain," and a tangential split "felt grain." Oak paling and wainscot panelling were always cleft radially, hence the name "cleft grain"; deal laths are always cleft in the felt grain, from lathwood which, as will be seen hereafter, is now nearly all sapwood. Oak for laths was first cut to the lengths required, then each round log was split with wedges into small pieces called "bolts"; these bolts were again cleft with a "dowl-axe" by the "felt grain" into pieces the width of the laths required, usually 1½ in. This operation was called "felting." Laths were now cleft from these pieces by the "cleft" in "quarter" grain with a tool called a "chit." Forty feet of round oak timber made twenty bundles, or hundred of heart laths, and ten bundles of sap laths. In 1700 the common price for oak lath splitting in Sussex was from 4d. to 6d. per bundle, and the laths, labour, and material cost about 20d. per bundle for heart and 14d. per bundle for sapwood. One hundred years later (1800) lath-rending was worth 1s. per bundle, heart laths sold for 6s. and sap laths for 4s. per bundle. A "carriage" of oak laths was 60 bundles, 40 being heart and 20 sap laths. Oak tile-pins, or pegs, were used to hang plain tiles on oak laths. A peck of pins did about three squares of "healing" with plain tiling, the tiles being 10½ in. by 6½ in. This size was also fixed by statute (17th Edw. cap. 4th). They were laid to a 7 in. gauge, each square taking about 2½ bushels of lime and five bushels of sand in mortar. Shingles were always cleft from oak butts. They were from 9 in. to 12 in. long, and 4 in. or 5 in. wide. When dressed they were 1 in. thick at one end and tapered to not quite ½ in. at the other end. Such shingles were in extensive use for covering church spires which were framed in oak. Shingles are always laid on boarding, that is, the

whole surface to be shingled must first be covered with boarding laid as if on a floor, and to this boarding the shingles are secured by nails, the shingles being arranged so that the gauge shall allow of "three waters," or in plain English, one shingle must overlap that immediately under it for two-thirds its depth, and the second one under it for one-third its depth, reckoning in each case from the head of the shingle. Suppose, for instance, that the shingles are 12 in. long, then each would show 4 in. to the weather, lap 8 in. on that immediately underlying it, and 4 in. on the head of the shingle in the same course below. In this case if the shingle is 5 in. wide, then it covers 20 super. inches of the roof, exactly as much as a slate the same size would cover if laid to the same lap. The lengths of all the shingles in any one horizontal course must be the same—not so the widths: they may vary from 4 in. to 7 in.; but wide shingles are objectionable, for they are liable to split. When shingles of irregular widths are used, the vertical joints will not necessarily come in the centre of the shingles below. They may break "bond" or "joint" as much as 2 in. when the shingles are wide. Shingle roofs are common enough in the States and Canada, though they are not in general use here, probably on account of our damp climate. With us they are sometimes fixed in a church spire instead of lead, when the framework is wood; but in the countries named they are used in ordinary dwelling-houses, and shingle roofs there are as common as tile roofs in this country. About one of the last materials any builder here would think of using for shingles is Yellow Pine (*P. strobus*). Yet that wood is extensively used in Canada and the States for shingle roofs. Cypress and Cedar are also used in the States; but the writer has not come across one American specification which provides for the use of oak shingles, the only material ever used for the purpose in this country.

American shingles are "breasted," or "shaved" and "sawed." The shaved shingles are usually of yellow pine, varying lengths from 18 in. to 24 in., they are ½ in. thick at the butts, and ¼ in. at the "points," and the finished surfaces are as smooth as if planed. The American architects usually specify that the shingles shall be "first-class." Shingles of this quality must answer to this description:—They shall hold the full length specified, the ends shall be square, and the butts of extra thickness (say fir shingles to 2½ in.), the points must be uniform, with no clips, sap (no matter how slight), the smallest knots, shakes, and rot, are all ruled out. Some of the Cedar shingles used in Virginia are 30 in. long, ½ in. thick at the butt, and tapering to ¼ in. at the point. A shingler will, of course, cover a roof faster with big shingles like this than with small ones. The standard width of a shingle is 4 in., and narrower are seldom packed in a bundle. 3 in. are sometimes made, and they are not objected to. A bundle of extra long shingles will contain only 100; one of ordinary lengths will contain 500. The best quality sawed shingles are made of split quartered yellow pine, and they are of various lengths from 12 in. to 18 in. The wood used must be free from defects of any kind; bastard-cut shingles are always rejected, for they are worthless in a roof. The great difficulty in getting faultless wood for shingles has induced manufacturers to put 12 in., 10 in., and 6 in. "clear" qualities on the market; that is, the lengths specified are faultless, but the remainder may be defective in some way; but this is not a matter of much importance, as the defects are not exposed to the weather. When yellow pine shingles are used they are dipped in creosote stain, and as an 18 in. shingle is usually laid 5 in. to the weather, it follows that the bond or lap of the shingles is 6½ in. Two nails are used to an ordinary shingle, and three to a wide one. Cut are better than wire nails, for the latter soon rust; 1,000 shingling nails weigh about 3 lb. A roof to take cedar or cypress shingles may be laid with pine "fencing," 6 in. by 1 in., spaced to suit the shingles. Each course of shingles is "flushed" and "over-flashed" against side walls. The English architect will be startled to read that specifications in the States provide for flashings of tin! The American architect is developing methods of construction peculiar to the States; these are generally the outcome of peculiar requirements, general or local. To build for posterity there, houses must be proof against fire, cyclones, lightning, and earthquakes. We are not much troubled with the three last, but our architects have to reckon on a much more destructive influence on good building than all three

combined—viz., that of the ground landlord. The number of shingles to a square is, of course, determined by the area of the shingle exposed to the weather. This area in inches, divided into 14,400, will give the number required. The number of shingles a man will lay on a roof in a day depends apparently on that man's capacity for lying! For a good day's work of eight hours any number from 2,000 to 10,000 is about the figure, subject to the condition stated. There are men in the States who do nothing but shingling, as we have men who do nothing but lathing (for plasterers), and these specialists can, of course, cover a greater space in the same time than an all-round hand; but that there could be such a difference as that indicated is sheer absurdity. We often hear of the number of bricks "cute Yankees can get Englishmen to lay; but if a few truck-loads of mortar are tipped with a barge-load of bricks, and the work is "bedded and flushed" with a steam-roller, the number of bricks a man can lay in a day is simply astonishing. When shingle-laying and bricklaying are subjects of discussion, shinglers and bricklayers write and talk as if they had taken leave of their senses. The writer once asked a competent bricklayer who was building an arch with bricks, every one of which had to be cut, rubbed, and moulded to templates, how many he could prepare and set in that arch in a day, he replied: "I should consider it a good day's work if I did as many as I could comfortably carry home in my frail." His "frail" was his food basket; and he did not exaggerate, for the amount of work a man will do in the day, whether at shingling or bricklaying, depends on the class of work he is engaged at, how he does it, and the material he has to use. English oak was, and is still, much used for fencing. An oak butt 5 ft. long and 15 in. in diameter can be cleft into 80 pales, and one 21 in. diameter into 130 pales. Good pales are always cleft and cut to straight edges free from sapwood. Oak is sawn into pales so that crooked, knotty, and defective stuff may be used which would not be possible in cleft work. The only part of an oak tree of any use for building is the trunk below the first branches of the crown or head. All the latter stuff is, however, not waste, for it is worked up into hurdles, rough gates, fence rails, gate-posts, and other farm work, the smaller pieces being used for cord-wood. There is a dangerous heresy in the home-grown timber trade which it would be well to expose, as it has a direct bearing on the use of oak in building. It is well known that before oaks are felled it is usual to remove the bark. This peeling, or "tan-fluing," begins in Sussex about the middle of April, and in the Midland counties about the end of that month. The season for stripping the oldest trees is generally over by May-day, but young trees will run through May and June. Now it has been explained in these articles that when sap rises in the trunk of a tree it swells the sapwood and bursts the bark. In this condition the bark is easily stripped; but when the bark grows and knits together again it cannot be removed.

When, therefore, the bark is to be saved it must be stripped when sap is passing through the sapwood, and as the tree is felled afterwards the sap is still in it; now timber merchants say that if an oak tree is felled in the winter months when the bark cannot be stripped the natural sap is out of the tree, and the sapwood in cleft goods made from it is perfectly good for use. This statement is incorrect. Oak sapwood, whether it is felled in the winter or summer, will decay rapidly, and is of no value for building. Architects should therefore condemn all oak sapwood, without giving any consideration to the time when the tree was cut down. The writer has cut down and converted many oaks, and he never found the slightest difference between the durability of the sapwood of winter- and summer-felled trees when both were subjected to the weather after having been seasoned for the same length of time. For strength and durability Sussex oak always ranked highest. That grown in South-West Kent and North-East Hants comes next, and this classification was arrived at after many years' observation in Government dockyards, where oak was almost exclusively used in building war-vessels. An English oak plank 3 in. thick will lose one-third its weight in seasoning after seven months. A fitch 10 in. thick will take over three years to lose weight in the same proportion—that is, supposing both pieces to be stacked green; hence, for all building work, when a tree is felled it



should be cut up at once to the smallest thicknesses required to facilitate its seasoning. When oak is steamed or boiled for twelve hours or more, it seasons much more rapidly than if left in its natural state. The medium height of an English oak is about 60ft., and the extreme height 120ft., the clean stem being in each case about one-half the whole height. Hedge-row trees are never as tall as those grown in groves, but they attain a much greater diameter. The following list of some extra-grown trees standing when English oak timber was in much greater demand for building than it is at present, may be of value as showing the size to which oaks will grow under favourable circumstances. Bedfordshire, Woburn Park, 5ft. 1in.; Berkshire, Windsor Park, 4ft. 9in.; Little Park, 8ft.; Buckinghamshire, Stew, 5ft. 8in.; Cheshire, Buckland Hill, 7ft. 8in.; Cornwall, Mount Edgecumbe, 2ft. 10in., a Spanish chestnut 3ft. 9in., with 30ft. clean stem; Devonshire, Filleigh Castle Hill, 5ft. 1in.; Dorset, Melberry Park, 9ft. 7in., "a curly, surly, knotty old monster, called Billy Wilkins"; Gloucestershire Ashwick, 5ft. 6in.; Hampshire, Strathfieldsay, 3ft. 2in.; Hertfordshire, Coln Green, 5ft. 5in.; Huntingdon, Kimbolton Park, 4ft. 6in.; Kent, Knowl, 8ft. 7in.; Lancashire, Townley, 4ft. 7in.; Middlesex, Southgate, 4ft. 9in.; Northamptonshire, Rock-

ingham, 5ft. 1in.; Nottinghamshire, Welbeck, 5ft. 5in.; Oxfordshire, Blenheim, 5ft., none sound above 3ft. 9in.; Rutland, Burley, 3ft. 10in.; Shropshire, Patshall, 3ft. 2in.; Somersetshire, Hinton St. George, 4ft. 9in.; Suffolk, Bentley, 6ft. 5in.; Sussex, Petworth, 6ft. 5in.; Spanish chestnut, 5ft. 1in.; Warwickshire, Warwick Park, 5ft. 8in.; Wiltshire, Wardour Castle, 7ft. 3in.; Worcestershire, Hagley Park, 6ft. 4in.; and Yorkshire, Studley Park, 6ft. 5in. All the above dimensions are diameters at 4ft. from the ground. An oak growing in Sheffield-place, Sussex, at 70 years old was 3ft. 10in. in diameter, which gives a fair idea of the rate of growth in good soil when a tree stands alone but protected from strong winds. The Spanish chestnut (*Fagus Castanea*) is quite equal to oak for building, but it is not easily transplanted, on account of its tap root, neither is it a forest tree, both of which reasons make the wood scarcer in the market than oak. In Sussex this tree sometimes grows to a diameter of 9ft. and over. The Horse-chestnut, *Aesculus hippocastanum*, grows rapidly: in thirty or thirty-five years it affords splendid shade, and is a highly ornamental tree; the wood is white, and mild to work; it never warps. For building it is of no value whatever, but carvers use it in decorative work. The accompanying sketches show end sections of oak

and other hardwood logs at present imported for building. It will be noticed that the Quebec oak logs are badly shaken. This fault leads to great waste in conversion, especially when small scantlings are required. Shakes are usually classified as "star" or "ring"; many of these logs show both kinds combined. The grading of Quebec oak timber is as follows:—First quality must be free from rot, rotten knots which affect the surrounding wood, ring shakes, and great or large worm holes; small worm holes and shakes allowed according to the judgment of the culler. Second quality is all timber not up to first class, but better than culls. Baltimore sends most oak into the English market. The grading there for sawn timber is "first," "second," and "culls." First quality must be not less than 8in. wide, free from all defects; but sap is not to be considered a defect if it is bright and sound. Second quality not less than 6in. wide, and at 8in. wide may have two standard knots (a standard knot is a sound one, which does not exceed 1½in. in diameter). Defects may increase with the widths, but all pieces must be free from heart, dry rot, dote, and worm-holes. Culls are all grades not up to second quality. Quartered oak is also graded as "first," "second," and "culls." First quality must be 5in. wide and over, clear of all defects; seconds, 4in. wide

and over, at 6in. wide; two standard knots or a little bright sound sapwood will be allowed, but no other defects, and these may increase with the widths. All boards and planks must be bold, the full thickness, have parallel edges, which must be square, and square ends. The standard lengths are 12ft., 14ft., and 16ft., and the standard thicknesses 1in., 1½in., 1¾in., 2in., 2½in., 3in., 4in., and 5in. Worm-holes are the most serious defect in hardwood lumber, and face-cracks reduce it one grade in sorting. Newels are cut square outside the heart to lengths of 4ft. or multiple of 4ft.; on cross section they are cut from 5in. to 10in. The Odessa wainscot-logs show the prevailing forms as sent here; the tree is cut through the heart, and each heart becomes a wainscot-log, when the corners are removed as shown. The outline of the sides of the logs show that in conversion for sashes, doors, or other pricing there must be a considerable amount of waste. Each log is hollow-backed as a rule, and this irregularity cuts to waste, this being greater in the narrower boards at the sides than those cut out of the centre of the log. Austrian oak wainscot logs are generally of much larger size than the Odessa logs. Consequently there is less weight in cutting them up. The wood, too, is mild in working, so that a Trieste oak log is preferred by builders to that imported from any other place. Libau oak planks are shown in four sketches, each pair representing different ends of the same piece. It will be noticed that the planks taper from 6in. to 7in. along the backs, a fault which gives rise to much waste in conversion. Some Honduras mahogany and cedar logs are badly shaken, as shown. The teak logs will be referred to in the next article.

THE PROPOSED FURTHER WIDENING OF EAST STRAND.

THE triangular site acquired by the London County Council on the north side of the Strand, between the churches of St. Mary and St. Clement Danes and bounded by Newcastle-street and the eastern arm of Aldwych, has now been almost cleared of buildings, and increasing interest attaches to the four or five alternative proposals for further widening this section of the Strand. Each scheme is indicated on the vacant land between the island churches by ranges of poles and boards, the boards being painted in different colours to indicate the several modifications of the frontage line proposed. The Improvements Committee of the County Council have announced that they propose after the summer recess to bring up a definite recommendation as regards this frontage. The committee remind members of the Council that the scheme which was finally adopted by the Council was one which embraced certain suggestions made by the Royal Institute of British Architects, slightly modified to make the crescent road (Aldwych) connecting the new main street with the Strand more symmetrical. By this scheme a minimum width of 100ft. was to be provided for the Strand, as well as for the streets leading to Holborn and now named Aldwych and Kingsway. The width of the Strand gradually increased to 160ft. to the east, and also to the west of St. Mary-le-Strand Church, in order to provide a minimum width of 50ft. for the traffic on each side of the church. In the large open space between the eastern end of the crescent site and the western side of St. Clement Danes Church, the Council agreed on March 13, 1900, to allot to the Gladstone Memorial Committee a site for the purpose of the monument proposed to be erected by the memorial committee.

The committee have recently had before them, however, a letter from the Royal Institute of British Architects calling attention to a suggestion by Mr. Hamo Thornycroft, R.A., of considerable amendment of the Council's line for the northern frontage of the Strand between the two churches, with a view (a) to bringing the church of St. Mary-le-Strand into alignment with the centre of the thoroughfare; (b) to making the direction of the thoroughfare aim at the front of the church of St. Clement Danes and not at one corner of it; and (c) to securing for the future a good view of the Courts of Justice to all approaching that building from the Strand on the west. The Royal Institute has stated that although in entire artistic sympathy with Mr. Thornycroft's scheme, it is fully alive to the difficulties, financial and otherwise, in the way of its execution, and the Royal Institute has therefore suggested a modification which it thinks could be carried out with a com-

paratively small sacrifice of pecuniary interest, and would practically secure the advantages of Mr. Thornycroft's scheme. By Mr. Thornycroft's proposal the portion of the Strand between the eastern end of St. Mary-le-Strand Church and Aldwych would be widened to an average width of 150ft.; by the Royal Institute's plan the average width would be about 120ft. The Royal Institute has contended that by carrying out its plan a better view would be afforded of both churches from either end, and also of the Law Courts, and the apparent narrowing of the Strand at the point in question would be obliterated, and that, although the eastern end of the crescent site would not be entirely symmetrical with the western end, this would be observable only on paper, and would not be seen when the actual work was carried out. The Royal Institute has also pointed out that by further widening the Strand in the manner suggested the sharp, awkward corner at the eastern end of the crescent site, as contemplated by the Council's plan, would be avoided.

The committee have also had before them a letter from the Royal Academy of Arts suggesting that the fullest consideration should be given to Mr. Thornycroft's proposal, and a letter from the Further Strand Improvement Committee, forwarding a plan showing an amended line suggested by that committee, the line being somewhat similar to the one originally proposed by Mr. Thornycroft.

The committee add that they were impressed with the importance of the suggestions made by the Royal Institute, and accordingly invited certain of its representatives and also Mr. Thornycroft to meet them on the site in order that they might fully explain their proposals to them, and they have since had before them a plan submitted by the Royal Institute showing definitely the scheme which it now proposes.

A further suggestion was laid before the committee by the Council's superintending architect, by which plan the average width of the Strand would be 115ft. Mr. Thornycroft at his interview with the committee expressed himself as being generally in accord with the proposal now made by the Royal Institute.

If the modification originally suggested by Mr. Thornycroft were carried out, it would necessitate the addition to the public way of the Strand and Aldwych of land which would otherwise be let for building purposes, and is valued by the Council's valuer at £350,000; the loss of recoupment if the Council were to adopt the amendment suggested by the Royal Institute of British Architects, and now accepted by Mr. Thornycroft, is estimated at £70,000; while the loss to the Council if the suggestion made by the Council's superintending architect were adopted is estimated at £59,000.

The final recommendation of the committee and the Council's attitude towards it will be awaited with considerable interest, and examination of the rival proposals on the site suggests that the modified R.I.B.A. scheme would probably prove in the end the most remunerative, as well as most conducive to the amenities of the widened thoroughfare.

THE NEW POST OFFICE, PIETER-MARITZBURG.

THE new General Post and Telegraphic Offices, for which the tender of Messrs. Williams and Bell, at £101,300, has been accepted, are to be erected in Longmarket-street, Pietermaritzburg, on the site between the Victoria Club and Messrs. Randles, Bros., and Hudson's warehouse.

An inspection of the contract plans, says the *Natal Witness*, shows that they are based on a comprehensive study of the composite requirements of modern structures and practical acquaintance with several of the most successfully executed offices in Great Britain and the Colonies. In an extensive basement provision is made for the main cable system and distribution services, allied with storage and linemen accommodation. On the ground floor the public is brought by different entrances into direct and close touch with the post and telegraph offices and savings bank, each of which is so divided as to be practically self-contained, though once within the precincts of the building business with the whole can be despatched without leaving and re-entering from the street. Ready ingress and egress, conspicuous position of posting boxes, privacy of telegraphic and monetary operations, are salient features.

The drawings of the main postal hall, with its floriated columns and arcading reaching to a height of 28ft., and circular counter, exhibit quite a sumptuous apartment. The savings bank has clerical accommodation on the floor above, with facilities for even further extension. The two upper stories are devoted to the administration of the post and telegraph departments and telephone exchange, with most ample public and private staircases, corridor, waiting spaces, and luncheon and cloak rooms. The elevations, which are to be executed entirely in dressed Natal stone, with ornamental features at various points, are based on a somewhat earlier phase of the Renaissance than is generally in vogue, and though in harmony with other Government buildings in the city, thereby present a marked distinctiveness of character. The main façade measures in length 236ft., with returns extending some 100ft. to side carriageways. This, with boldly-carved ends, copper-covered turrets, granite-shafted porticoes, and massively wrought central archway, is certainly of bold and dignified appearance, and when completed will rank not only among the most extensive, but be one of the finest architectural edifices in South Africa.

Mr. William Lucas, F.R.G.S., F.R.V.I.A., whose design was unanimously chosen by a Board of Referees, has been intrusted with the preparation of the drawings and supervision of the work.

RURAL HYGIENE.*

THE third edition of this useful little work contains a series of essays by George Vivian Poore, M.D., F.R.C.P., Professor of Medicine, University College, London, &c. Dr. Poore treats on a variety of subjects. There are chapters on the 'Concentration of Population in Cities, Modern Sanitation, Hygienic Units, The House, Air, Water, Experiences in a Country Town, Water Supply, Burial, and others, in which the author bases his remarks on a varied experience, and upon reliable data. In the chapter, "Concentration of Population in Cities," the author makes some sensible remarks. He says crowds of independent and idle persons settle in towns because they can find a greater variety of methods of killing time, or because there is more civilisation than in the country. But what is civilisation, asks Dr. Poore? A recent anonymous writer (the author of "Behind the Bungalow") speaks of this "half-hatched civilisation of ours, which merely distracts our energies by multiplying our needs, and leaves us no better off than we were before we discovered them." Some useful remarks are made as to "death rates," which are often misleading when applied to seaside resorts and other localities. Certain facts must be taken into consideration—the mobility of the population; for a man who has contracted a fatal disease, say in London, may die at Croydon, Brighton, the Riviera, &c. Estimated death rates are often very erroneous. Thus the last census showed that the estimated population of West Ham was 58,278 in excess of the truth. Many other towns had made similar errors, so that "estimated populations" are unreliable. Correction must also be made for abnormal age distribution. Thus in Central London, as the author remarks, there is a great deficiency of persons at the extreme and vulnerable periods of life, and it is largely made up of selected adults imported from the country, and this helps to keep the death-roll low. "As it is, the high death rate of the centre is diluted by the low death rate of the outskirts, and the healthiness of Hampstead, Lewisham, and other outlying districts conceals the condition of the centre." Identical age periods are the most certain. Dr. Poore disputes the statement that London is the healthiest city in the world, which he regards as fallacious, because, taking the death-rate of children under five from all causes in England, it is seen the highest death-rate among children was in Lancashire, the next highest the county of London, and the lowest was in the county of Dorset. The author examines in detail the child mortality in several London districts. After a comparison of districts, the author shows that to Liverpool belongs the distinction of being the most unwholesome place for little children in the whole country, and the Strand (the very centre of London) comes next. We do not follow the author in all

* Essays on Rural Hygiene. By GEORGE VIVIAN POORE, M.D., F.R.C.P., &c. Third edition. London: Longmans, Green, and Co.

his conclusions. He says "the worst districts in Hampshire are below the average of the whole kingdom in the matter of infant mortality." It may be so with regard to infant mortality: but if we take other statistics of adults, the comparison is not so unfavourable. The remarks on overcrowding are interesting, and full of useful statistics. One table is given which shows that the mortality of London as a whole, taken as 1,000, is 14 or 15 per cent. higher than that of England and Wales. But can we fully rely upon these statements? At any rate, the death rates of many districts of London—Hampstead, Brixton, Streatham, Lewisham, and many East-end districts—have a percentage much below that of England and Wales. That the London fogs and overcrowding raise the death rate will not be disputed; and the author's conclusions on our modern cities, and the rage for tenement houses, model dwellings, and flats cannot be questioned. He instances the public health in Chicago, where the death rate from zymotic causes is considerably more than that in London, owing to the overcrowded buildings on a small area. The modern hotel or block of tenements is pointed to as favouring the worst conditions, where each floor ventilates into the floor above; while the lifts drive the air from one floor to another without renewing it. Many of the unhealthy conditions of London life and overcrowded buildings are dealt with—the difficulty of locomotion, for instance. As the author observes: "The check put upon freedom of locomotion by overcrowding and the time occupied in going from point to point more than counterbalance the shortness of the distance we have to travel, to say nothing of the fact that vertical movement requires twenty times the force of horizontal movement." The defective provisions of the London Building Act and the Model By-laws are criticised, and some good suggestions are made. Our author holds up to condemnation the building societies, and exposes many of their failings, and the hardship inflicted on artisans who start in life with a mortgage round their necks. We have no space left to enter into other topics discussed relating to sanitary subjects and country life. Dr. Poore's experience as a practical hygienist leads him to point out many of the deficiencies of our modern systems of sanitation, the utilisation of sewage, and the productive value of the soil when properly treated. The chapter on "Hygienic Units, the Living Earth, and Circulation of Organic Matter" is worth reading for the light it throws on many questions of rural health and economy.

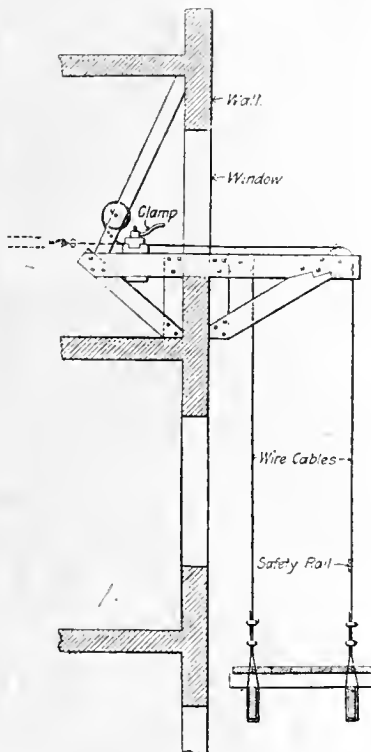
SUBWAY AND MOTOR ACCIDENTS.

ACCORDING to the precautions made against fire and mishaps in the American subways or tunnels, no sort of catastrophe as that which befell the hapless victims in the Paris Subway could happen. It is stated on the authority of the *Engineering Record* that the precautions against fire in the subway divisions of the New York Rapid Transit Railway are elaborate. A water main runs along the wall, with reels of hose at frequent intervals, which will furnish powerful streams for putting out any fire that may break out. The trains will be made of metal cars, not the wooden type used in Paris, and the insulation of the electrical equipment is very heavy. In short, the engineers of this road are said to have prepared their plans so that such an accident as happened in Paris is improbable. These precautions are absolutely necessary in view of possible accidents. There should certainly be a hose laid on with a supply of water. The cars, too, should be of metal or constructed with some other substance, such as uraltite, to render them incombustible. These two precautions would reinsure the public, and the alarm and panic caused by the appearance of fire and smoke would be avoided. But a mad rush to the exits by a panic-stricken crowd is a possible event which ought to be provided for by well-lighted stairways with landings at intervals and handrails, and lifts of fire-resisting cages. Even the most elaborate equipment has often failed in a panic from some insignificant cause, such as the sudden extinguishing of the lights in the tunnels, which cannot be too well lighted, with a double source of supply—gas as well as electricity.

The hundredth anniversary of the birth of John Ericsson was celebrated in New York by the unveiling of a statue in Battery Park. The statue is the work of John Scott Hartley.

A SAFETY SWINGING SCAFFOLD.

A SAFETY swinging scaffold, designed particularly for use in the facing of high buildings of steel-frame or ferro-concrete construction, which have an outside covering of brick, terra-cotta, or stone, has recently been patented by W. H. Ellis and Company, of Cincinnati, and successfully used by them on the fifteen-story concrete-steel Ingalls Building in Cincinnati, now nearly completed, fully described and illustrated in the *Engineering Record* of May 23 and July 18, 1903. The "Ellis" scaffold consists substantially of a platform in sections, suspended by wire cables from brackets supported by the walls of the building at window openings in an upper story, as indicated in the drawing.



Each pair of cables supporting the platform sections passes over two sheaves in the horizontal member of a bracket, and is held by a clamp inside the building. The platform may be raised or lowered by means of block and tackle attached to the cables, and may be held at any height convenient for the work. The platforms have solid floors, preventing the dropping of materials, and an outside guard-rail, insuring the safety of the men. Preferably the sections are placed to abut, so as to form a continuous staging along a whole side or clear round the building, so that the work may be completely finished to any given level before raising the scaffold. Other advantages of this scaffold besides those indicated are that the sidewalk and the portions of the building below it are not obstructed, and the work below may be left completely finished instead of having putlog holes to be filled afterwards.

COMMISSION HUNTING.

THE *American Architect* tells a tale which points a moral, perhaps not quite without point this side of the water. It seems that recently a certain California town was notified that Mr. Carnegie had consented to make it one of the beneficiaries under his benevolent system of increasing the educational opportunities of his adopted country, whereat there was at once public rejoicing, and a special rubbing of hands on the part of the library trustees. Their exultation was, however, quickly chilled by receiving from a certain architect a long communication, in which he claimed that it was due solely to his unaided personal efforts that this happy result had been achieved, and that consequently he wished the trustees to understand that he considered that he had valid claim upon them for appointment, at the usual full commission, as architect to the proposed new building; and he further generously offered to work over without charge a certain

design prepared by him for the library so as to adapt it to the new selected site and fit it to Mr. Carnegie's gift. In support of his claim he narrated how, finding, in 1902, that the town had no library, he "took the trouble to locate one or two of the library trustees"—entire strangers to him—and suggested that they should approach Mr. Carnegie, but was told that an unavailing attempt had already been made. The architect, however, felt sure that should he prepare a new design and submit it to Mr. Carnegie the prayer would be granted and the town secure its library, and he would prepare such design if it were to be understood that he should be appointed architect to the building at the usual commission. This proposition he now maintains was accepted, and he argues that as Mr. Carnegie had experienced a change of heart it must be because of his efforts, and he consequently calls upon the trustees to make good the promise he received. In support of his contention he offers further proof which on the face of things seems likely to be of questionable worth, for among other things he declares that the design proposed by him "is, or should be, still in your [their] possession," while it seems to us his claim would have been stronger if he could have declared that it was in Mr. Carnegie's possession or had even been seen by that gentleman. The trustees rejoice by saying that in some degree the tale is true, but that in one all-essential particular the claimant is at fault, for they point out that the gentleman named by the architect as having closed the bargain with him was not capable of binding them, since, although now one of the trustees, he was not at that particular time a member of the Board, but was simply one of a certain private committee which at that time was endeavouring to secure, by public subscription, enough money to build the library without Mr. Carnegie's help. Apparently the architect has drawn hasty conclusions from insufficient premises, and must content himself with being one of the architects invited by a properly empowered board of trustees to submit a design in competition with other architects. The moral drawn from this is that when one sets out to "locate" a trustee he should do it with the same scrupulous care he would practise when visiting a land-office. Hares are not the only thing that a hungry man—anxious for a dinner or for a job—should take particular care in catching.

BUILDING SAND.

THERE are three kinds of sand used in building—namely, Pit, River, and Sea Sand, all of which were originally produced by the action of running water on rock of some kind. The process was something like this:—At first large blocks of stone were detached from their beds by river currents, or from cliffs by breakers along some sea coast. These angular blocks were ground against each other until they became rounded boulders, the waste being sand. This grinding action being continuous, the boulders were gradually worn down, and in course of time became shingle, and finally the shingle itself was rolled and ground until the whole became sand. Sand will necessarily be of the same mineralogical character as the rock from which it was derived, the waste of a granite rock being sand with grains of quartz, felspar, and mica; that of a hard limestone rock grains of pure limestone, whilst soft rocks like chalk yield no grains, for constant rolling and attrition in water convert them ultimately into calcareous mud. Nature sometimes reverses this process, converting loose sands into sandstones, and as many such derivative rocks have been worn down and converted into sand it is not possible to say how often or how long the same materials have previously existed as loose sand or as compact sandstone. It is a well-ascertained fact that many beds of the New Red Sandstone are built up with sands the grains of which are spherical, a shape they could only have attained by being windblown in a dry state across some desert, or along a sea-shore. Water-worn quartz sands are never so round in the grain as those produced by a sand-blast. All sandstones and grits—in fact, all non-calcareous sedimentary rocks—are built up with materials originally derived from the breaking up by chemical and mechanical agencies of granitic and schistose rocks, the substances so obtained washed, sorted, and deposited by running water, or held in solution by it form the whole bulk of all our sands and sandstones. Sandstones are sands which have been consolidated by pressure,

and the infiltration of some cementing matter such as silica, lime, or hydrous oxide. The first sandstones were therefore derived from the waste of fire-formed rocks, the succeeding sandstones from the waste of water-formed rocks. Sandstones of the older geological formations, pre-Cambrian and Cambrian, have mineral constituents in such condition as show them to be more directly related to granites than the sands and sandstones of more recent formations. The closer any sand is deposited to the parent rock the more unlike will the grains be in mineral composition and size, and the farther a sand is carried the more perfect will be the sorting of the material in every way. Any mass of even-grained sand carries in itself evidence that it has travelled a long distance from its source, for water transit separates one mineral from another on account of their different specific weights, and coarse fragments from fine by the varying velocities of the current. Water flowing rapidly will bear along with it shingle and fine sand. As the velocity decreases the coarser pebbles will be dropped, then the finer, and last of all the sand itself, for with loss of velocity water loses its transporting power. From what has been said it is evident that sands and shingle were not originally "created" as such, nor were they deposited where they are now found by any other agency than that of running water. It is also clear that whatever may be their position at present, they formed at one time the bottom of a sea, lake, or other large sheet of water. The questions suggested by a visit to any sandpit are—(1) Of what mineral, or minerals, is this sand composed? (2) From what kind of rock was it derived? (3) Where was the parent rock situated? (4) To what geological formation did it belong? (5) How did this sand come here? (6) Is it sharp and angular? (7) and finally (8) Is it clean? The two last questions affect its value for building purposes, the first five do not, and are of interest chiefly to the mineralogist and geologist. From a barge anchored in the Thames men dredge up ballast from the river bed. What is this ballast? On examining it carefully, the constituent fragments are seen to vary in size from fine sand to shingle. The material is easily recognised as being flint, with gains of chalk. The flint is "sharp"—that is, the angles produced by friction are plainly seen, and may be felt. The chalk is rounded, and this is so because flint is hard and chalk is soft. All the material in this ballast is "clean," for it has been deposited in water moving at a sufficiently high velocity to carry away any clay there may have been mixed with it. Flint is a material common to all chalky beds, and it is more abundant in the "Upper Chalk"—that of Norwich and Margate—than it is in the "Lower Chalk"—that of Mersham, Dorking, and Folkestone. Quartz is pure silica (SiO_2), and it is always found crystallised, each crystal being usually a six-sided prism, ending in six-sided pyramids. A cubic foot of quartz weighs exactly 165½ lb., and a cubic yard about two tons. Flint is amorphous silica with traces of lime, alumina, and iron, the three latter substances together not making quite one per cent. of the whole. Flint and quartz are, therefore, practically the same substance, the only difference being that one is found of a shapeless (amorphous) nodule, and the other a shapely crystal built up on the mathematically correct principles which constitute two of the "regular" solids. It is certain that when the calcareous mud (now known as "chalk") was deposited on some ancient sea bottom, the flints now found in layers in that chalk were not in existence. Where, then, did they come from, and how did they get into the chalk? Sea water contains a small quantity of silica in solution. Certain organisms, such as sponges and diatoms, provide themselves with silicious skeletons or coverings, the material for which they obtain from the water, and these organisms when decayed furnish silica for the flints. The strange shape and the minute structure of flints show them to be mineral aggregations which were formed round a nucleus of decaying organic matter. Flints, therefore, grew in the chalk after it was deposited as mud, and they did so by the gradual accretion of silica in an amorphous condition which had previously been held in solution by the sea-water in which the chalk mud was deposited. It is estimated that a little more than one-half the material in the rocks which form what is known as the earth's crust is silica. This peculiar substance, whether crystallised or amorphous, is insoluble in water and all acids except hydrofluoric;

but it may be dissolved in alkalies with great ease. Silica, crystallised as quartz, which is the chief constituent of all sands, grits, and sandstones, may be obtained as a fine powder by heating flint to redness and throwing it into water; the resulting friable substance is easily ground to any degree of fineness required. The broken flints in Thames ballast came from chalk beds through which the river and its tributaries have cut their way. The beds of flint gravels found in the Thames Valley, at some distance it may be from the present river bank, were all derived from great chalk deposits now completely washed away. All sandstones were at one time sand, and they are usually silicious, for the sand was originally derived from the waste of granitic and schistose rocks, as already described, which are richer in quartz. Sands are, however, richer in quartz than any granite, for the latter is composed of quartz and silicates of metals, which latter were removed in solution or as mud by the degrading action of water, leaving only the quartz to form the chief constituent of the sand. A normal granite will contain not more than 75 per cent. of silica, including that of the silicates with the quartz, yet the sand derived from it may contain 100 per cent. of silica as quartz. A sandstone, however, is seldom pure quartz, but it may contain from 75 to 88 per cent. of it, together with lime, magnesia, potash, soda, and iron oxide. A sandstone of pure quartz grains set in a silicious cement would be a "quartzite." Sandstones are frequently ground up for building sand, and this answers well for mortar-making; but it is not an ideally perfect material like pure quartz, for it contains alkaline silicates and iron. If a little coloured quartz sand is treated with hydrochloric acid, the colouring matter, which is iron, will be removed in solution, and transparent crystals remain: hence the gorgeously coloured sands of Alam Bay in the Isle of Wight, the green sand of Surrey, and the red sand of Cheshire are all composed of transparent glassy quartz crystals coated with iron in various stages of oxidation. Even the Carstone of Norfolk, which is a highly ferruginous sandstone, shows rounded grains of quartz, with granules of dark brown iron ore; minute scales of mica and traces of feldspar, thus clearly demonstrating its derivation from granite. The maximum thickness of the stratified rocks in Great Britain is about 72,584 ft. (nearly 14 miles) and in the whole world 177,200 ft. (34 miles). These rocks are all formed out of the wreck of much older deposits of even greater thickness, which must have been disintegrated and washed away. As the proportion of silica in all the stratified rocks is 53 per cent., it follows that there is enough of it in the world to make a hollow globe of quartz 7,900 miles in diameter, with a shell about 15 miles thick. Unlike slates and limestones, sandstones are poor in minerals, for they were necessarily deposited in rough water, and being nearly pure silica, there are no bases left in the sand with which that substance could combine to form new compounds.

The older rocks from the pre-Cambrian up to and including the Triassic all contain sands which have been converted into grits and sandstones, a few minor beds only of loose sand occurring in the latest of these formations. In the Jurassic rocks the first deposit of loose sand occurs which is of sufficient importance to get a distinctive name. Between the Upper Lias Clay and the Inferior Oolite micaceous yellow sands are found interbedded with sandy limestones, the whole attaining a thickness of about 200 ft. They may be studied at Bridport Harbour, where a section is seen in cliffs about 150 ft. high, built up with "Midford" sands, as they are called by geologists, from their having been first studied at a village of that name near Bath. The beds of sandy stone referred to as being found in these sands yield the well-known Ham Hill ferruginous limestone which is quarried near Martock, in Somersetshire. On the same geological horizon sand rock and ferruginous sands, attaining a thickness of over 80 ft., are found in the Midland Counties, where they are known as the Northampton Sands. These yield the well-known Duston stone, a fine fissile sandy limestone, quarried near Northampton, and also certain white sands, which are used for making mortar. Higher up in the Jurassic Rocks ferruginous sands, with calcareous grits and limestones, are found forming the Corallian Beds. Headington Stone, an oolitic freestone, which has a deservedly evil reputation in Oxford as a weather stone, was at one time extensively quarried in these beds. The latest sandy deposits

in the Jurassic Rocks are brown and yellow sands, which underlie the Portland stone, and take the name of Portland Sands from it. They are seen at Swindon and other places. It is rather difficult to determine their exact thickness, for they pass down gradually into the Kimmeridge Clay; but in the Isle of Purbeck they are not less than 200 ft. thick.

Cretaceous rocks overlie the Jurassic last described; the lowest division of these, the Wealden series, contains several important deposits of sand, with loam and fine soft sandstone. The Hastings beds of the Wealden rocks are made up of the Ashdown sand about 400 ft. thick, which is rich in loam, blue clay, lignite, and soft sandstone, and the Tunbridge Wells sand, about 400 ft. thick, made up of soft sandstone, sands, and clay, the latter alone attaining a thickness of close on 100 ft. in some places. The Lower Greensand consists of the Hythe beds, which are sand, sandstones, and limestones, the latter containing grains of quartz in the well-known Kentish Rag. The sands of these beds are dug all over North Hampshire and Mid-Kent; they form the well-known Gibbet Hill, Hindhead, and Leith Hill. A calcareous sandstone found in some of the top beds is called Bargate stone; near Godalming the Bargate stone lies on a buff calcareous sand over 40 ft. thick, and it is dug out of false-bedded sands, about 30 ft. thick. Near Maidstone these beds are Kentish Rag and Hascock only, so that the sands which are so well developed in some places are represented by limestones and sandstones only in others. The Sandgate beds are clays, greenish sands, and black sands, which are found in the cliffs between Sandgate and Hythe. They also occur at Pulborough and Petersfield. The Folkestone beds are sands made up largely of sponges and calcareous limestones. The Reigate, Aylesford, Berstead, and other sands are minor divisions of these beds. In the Midlands the Lower Greensand is represented by the Faringdon (Oxon) iron sands and gravels, the Shotover sands, the Woburn, Potter, and the Leighton Buzzard sands; but in Lincolnshire and Yorkshire the Lower Greensand beds are represented by clays only of various colours. The Upper Greensand beds are greenish grey sands, and the soft sandstones which were extensively used in ecclesiastical buildings of London from the 13th to the 15th centuries, the best-known quarries or galleries being at Mersham and Reigate.

Greenish sands and sandstones of this period crop out from under the chalk rocks in many counties. Not far from Warminster beds of chalk are found in these sands; they are wholly made up of sponge spicules; the chalk is sufficiently hard to be used for road metal. Thanet sands, which include a layer of green-coated flints on which they rest, are seen resting on the chalk in the cliffs at Pegwell Bay, near Ramsgate. They are also found between Herne Bay and Reculver, and at Charlton, near Woolwich, where foundry sands have been dug from them. Overlying the London clay are the pale yellowish grey Bagshot sands, and these, like many other geological deposits, have no constant lithological character over large areas, for pure sands are in these beds represented by nearly pure clays at Poole in Dorset and other places. These clays, like the sands, were derived from the breaking up of granite rocks, having been derived from the felspars in them, which are all aluminium silicates.

The Bagshot sands are the latest important deposit of loose sands reckoned in the solid geology of this country, the most recent being glacial and alluvial deposits of what geologists know as the Quaternary Age, which are found scattered all over the country, occupying no definite position with regard to each other or to the older deposits. Glacial and alluvial beds are sands, gravels, and clays intermixed, the debris of all rocks older than the Glacial period. They include granites, sandstones, and limestones, which have been broken up and transported across the country, "up hill and down dale," by moving ice, for the whole surface of the land was at one time covered by glaciers, which broke into icebergs all round the coast. Ice was, therefore, one of the most potent factors in originating sand; but its action terminated in this country long before our ancestors hunted the lion on Hampstead Heath, or chased the rhinoceros and elephant across the Surrey downs—a lapse of time measured back from us by about 50,000 years.

Sands and sandstones are so intimately related that a general description of one applies equally well to the other. Sandstones, for instance, are

either simple or compound, the simple containing quartz only, and the compound quartz plus some other material, which usually determines the name of the sand. Simple sand is quartz ore or silicious—that is, its constituent mineral is quartz. Compound sands are felspathic, micaceous, calcareous, or ferruginous, as the added grains are feldspar, mica, calcium carbonate, or ferric oxide. The most common impurity found mixed with sand is clay, in which there is a considerable quantity of iron—a mixture common to so many sandstones. Now, from the architect's point of view, this added clay or mud is about the most objectionable accessory substance which could be found in either sand or sandstone. No mortar or concrete made with lime or cement of any kind will set if dirty sand is added to them—in fact, the addition of such a sand irretrievably destroys the best cementing material, and the smallest quantity of clay in a sandstone will render it absolutely worthless as a building stone. As sands are found compact as sandstones, so shingle is frequently found changed into conglomerate, which is really a coarse compound sandstone, with pebbles of quartz, slate, limestone, or other rock imbedded in a matrix of more or less silicious cement. The conglomerate becomes "breccia" when the pebbles are angular, showing that they have not been washed about very much since they left the parent rock. Concrete is an artificial conglomerate made with lime or cement which becomes as hard in a few hours as a natural concrete would in as many centuries. It is fortunate that the most valuable constituent of sand is that one which resists abrasion most, and the least valuable constituents are those which are easiest ground to clay or sand. Quartz grains below $\frac{1}{16}$ in. in diameter will travel over rocks down stream for five miles without being sensibly worn, and grains under $\frac{1}{16}$ in. in diameter will travel over 3,000 miles before they assume the shape of rounded pebbles. Large pieces of flint or quartz are worn down more rapidly than finer grains, for the former are incessantly rolled and ground against each other, whilst the latter remain suspended in water unless it is absolutely still. A naturally formed granite sand which has travelled a great distance will resist abrasion in proportion to the relative hardness of its constituent grains, the quartz remaining angular, the feldspar more or less rounded, and the mica flake worn at the edge. Sharpness or angularity is a prime factor in the efficiency of any sand used for mortar which is to be submitted to transverse stress. It appears, however, from actual experiment that sand with rounded grain makes stronger mortar if it is to be subjected to compression only.

Granite, sandstones, and grits are ground under edge-runners, or broken in steam crushers to make building sand. Typical granite is a holocrystalline mixture of quartz, feldspar, and mica. Consequently, the sand obtained directly from it by artificial means will have the same proportion of these substances as the granite has. Sandstones have been already described: they are ground for sand, and so are the kindred rocks known as grits. As few builders know the difference between sandstones and grits, it may be as well to explain it. Grit is a coarse-grained arenaceous (sandy) rock with angular component fragments, which, though crystalline in structure, are seldom nearly perfect crystals, the whole being set in a highly silicious cement. Sandstone is built up with finer grains than grit; these grains may be crystals or crystalline aggregates of quartz, and they are less completely incorporated with the cementing matrix. Quartz rock differs from a pure sandstone in that it is a metamorphic as well as a derivative rock; it is, in fact, a sandstone which has undergone a peculiar change that destroyed all evidence of its mechanical origin. Sandstones and conglomerates being concrete, more or less fine, the "aggregate" can in each of these be seen imbedded in the cement "matrix"; but there is no trace of this structure in quartz rock, owing to the infiltration of silica at a high temperature in presence of water when the rock existed as a simple sandstone. Crushed quartz rock makes good sand for building. Pit sand should be sharp, gritty, and free from loam and vegetable matter, not too coarse in the grain, and with an admixture of finer particles to partially fill up the spaces between the larger grains. If pit sand is dirty it must be washed in clean fresh water until all traces of loam are removed, and that this has been done may be easily ascertained by rubbing the sand when damp between the fingers, which will not be stained if the sand is clean. River sand is usually free from

loam; but much vegetable matter is frequently brought down and deposited with it: this must be removed by washing. The best possible way to wash sand is in a running stream, the force of which is just enough to remove the mud and very fine sand, leaving the fine grit and coarser particles behind. Sand is sometimes sifted and washed by placing it in a sieve held in a tub of water. A quick horizontal motion from side to side causes the smaller grains to pass through the sieve and fall to the bottom; much dirt is in this way carried down with the sand, so that the process is not to be recommended. It is supposed that the mud remains suspended in the water until it is poured off, and the coarse stuff remaining in the sieve is rejected as being unfit for the work;—as a matter of fact, much of the mud is deposited with the fine sand, rendering it quite unfit for mixing with lime or cement. Sea sand is altogether unfit for building, unless all trace of salt is removed from it; this may be done by constant washing in running clean fresh water. The most convenient way to effect this will be to construct a washing-tank in the ground, about 6 ft. square and 18 in. deep, lined with brick in cement. The sand should be filled into this to a depth of 10 in. or 12 in., and a stream of water turned on it. A brown frothy scum soon rises to the surface. The sand should be constantly stirred. When the water runs off clear, and without having a saline taste, the sand may be removed for use. It is well to bear in mind (1) that the individual grains of sand contain no salt; (2) that the salt merely coats the grains or lies between them, having been deposited there by the evaporation of salt water; (3) that the salt is soluble in water, and may be entirely removed by careful washing; and (4) sea sand so washed is quite as good for building as any pit or river sand of equal fineness and smoothness of grain. Walls are sometimes built with a mortar of lime and unwashed sea sand, the inside plastering being of lime and washed sea or pit sand, and no inconvenience results if damp does not penetrate through such walls from the outside or upwards from the foundations. If either of these things happen, the sea-salt is carried through from the unwashed sand by the damp, and it crystallises in patches on the face of the plaster. A cube foot of sea-water weighs 64 lb., and it contains about $1\frac{1}{2}$ lb. of common salt and nearly another pound of magnesia and calcium salt. Sandhills are sometimes found by the seaside, above and beyond the reach of tides. Sand found in these is fit for use without washing, as rain falling on the sand dunes for perhaps centuries has washed away all trace of the saline matters originally deposited in them.

Eighty years ago the building world was agitated about the frequent use at that time of sea sand in mortar, and advocates for its use maintained that the prejudice entertained by many persons against it was altogether unfounded. Mr. Peto, then a builder in Little Britain, used no other than sea sand in the great hospital he built at North Yarmouth, and innumerable witnesses, including builders, town surveyors, and bricklayers, all testified "in the most solemn manner" to the unexceptional quality of mortar made with sea sand; in fact, one courageous gentleman, Mr. Leggatt, "an eminent surveyor and builder of Brighton," declared "under the most solemn obligation" that he always used sea sand for making mortar in preference to any other, and, furthermore, that when it became necessary to pull down walls built with sea sand it required double the labour to what it did to pull down walls built with mortar made of any other sand. The writer once had a contract to erect an important building at Great Yarmouth, and he, too, was fascinated with the sea sand, but chiefly on account of its cheapness; but he always took these laudatory statements of its paramount value as he did the sand itself, *cum grano salis*. It may be taken as an established fact that with all builders at the seaside sea sand is an essential ingredient in good mortar, and that with all builders inland no sand can equal pit or river sand, whilst that obtained from the seashore is valueless, and should not be used unless a damp house is required to be built! A practical man, writing from Belfast some time ago to a leading building paper, said that the best sand used there was obtained between high and low water on Hollywood Beach. Precaution was taken to "kill" the salt by slaking the lime between thin layers of the sand, the killing process being effected by drying and heat. It need scarcely be

said that neither of these neutralise the salt in any way, and that there is nothing whatever novel or useful in the process.

Sand does not absorb water in any appreciable quantity, its bulk is not diminished or increased by cold or heat, it does not contract in drying; therefore the greater the quantity of sand used in mortar in proportion to lime, the less probability there will be of the mortar shrinking and breaking. The cohesive property of the mortar is, however, improved by the addition of sand, and the volume of the latter in proportion to the lime used is limited rather by this consideration, than by the efficacy of the lime to bind the sand together, as the mortar, whether lime or cement, will work too "short" if too much sand is used. The quality of mortar entirely depends on the purity and sharpness of the sand with which it is made, and the setting properties of the best cement or lime will be, as already pointed out, entirely destroyed by the use of garden mould or dirty sand. Mortars over 500 years old made with loamy sand are found to possess no cementing property whatever, and they run from the hearting of thick walls in streams of dust without any apparent trace of the lime used originally in them. In erecting new walls on the site of old ones, it is usual to work up the old mortar as sand; but this should not be allowed, as in nearly every case the old mortar, through being made with loamy sand, is valueless for the purpose, and will, if mixed with clean sand, only injure it. The use of old mortar has this to recommend it: a much smaller quantity of lime will make it into a working paste than will be required from clean sand. Roadscrappings, from hard roads, are frequently used with lime instead of sand to make mortar; but as the proportion of grit in them is so small, compared with the mud, horse-droppings, and other filth, they do not make good mortar. Scrapings from soft roads are simply mud. Burnt clay, bricks, tiles, and soft stone are frequently broken up and ground to be used instead of sand. These, if free from dust, make a quick and fairly hard-setting mortar; but, unlike sand, they are porous, and consequently will absorb water. Mortar made with them is liable to crack and shrink in drying, and where a waterproof wall is required, they should never be used instead of clean, sharp quartzose sand. Good building sand should be of pure quartz only, with grains of known sizes; for instance, such as will pass through a 30 and be caught on a 40 sieve. It is only by adopting some such specification for a sand that the best results are to be obtained in making mortar. The quantity of lime or cement that must be added to a sand, other things being equal, will depend on the voids in the sand; the finer it is the greater will be the content of the voids, and consequently the larger the amount of cement material required to fill them. The content of the voids in, say, a cube foot may be ascertained by filling a box that size with damp compact sand and adding water from a graduated measure until the vessel will hold no more. The volume of water so added will, of course, represent the exact content of the space between the grains. Fluid measure is converted into cubic contents by allowing for every gallon 277.27 in., for each pint 34.659 in., and for a fluid ounce 2.166 in. There are 6.232 gallons in a cubic foot, and the bushel, which is a favourite measure for cement, lime, and sand, measures 2218.192 cu. in. or 1.283 + cubic feet, holding exactly 80 lb. of water. If 17 pints of water can be poured without overflowing into a measure containing exactly 1 cu. ft. of sand, it is obvious that in the measure there are 1138.8 in. of sand and 589.2 in. of void. It does not follow, however, that if cement and sand or lime and sand are beaten together in these proportions that they will make a cube foot of mortar, for there is always a shrinkage in volume when these materials are tempered or ground together with water. Neglecting fractions, the weight of a cube foot of quartz is 166 lb. If the weight of a cube foot of quartz sand is known, the difference will give the voids. The weight of coarse sand is about 113 lb., medium 103 lb., and fine 98 lb. to the cube foot; the voids in each will, therefore, be coarse 53 in., medium 63 in., and fine 70 in. It is, therefore, necessary, before specifying what proportion of sand is to be used with lime, to ascertain from an average sample of the sand what the voids in it amount to, and proportion the cementing matter accordingly. It is necessary to bear in mind that if sand is washed through a sieve it will be much finer than if passed through it dry, and that the voids in a sand can be reduced con-

siderably by packing, this reduction depending a good deal on the size of the grains. Thames ballast passed through an 8 and caught in a 16 sieve, on being filled into an upright cylindrical vessel took one-twelfth more when well shaken down, and a finer sand which passed through a 32 sieve took one-ninth more when treated in a similar manner. Both these sands shrank considerably in volume when water was added to them, even after being shaken down as described. Fairly coarse sands—those which pass a 20 sieve and are caught in a 40—make the strongest mortar; above a 20 sieve and below a 40 the resulting mortar with lime or cement is perceptibly weaker. In various experiments sand below 40, no matter how fine, showed little difference in value for mortar making, but in all cases the shape and condition of the grains have as much to do with their value as the size.

TESTS OF PORTLAND CEMENT.

IT is well known that the tensile test for Portland cement is not a satisfactory mode of finding its strength, chiefly because it does not measure the resistance to compression, which is the main consideration in practical work. Tensile resistance of cement is rarely required. Many authorities have abandoned this test in favour of cross-breaking, which is more easily made. Then the question of the soundness of cement—one of the chief things necessary—cannot be found by either of the above tests. The German test for soundness is tedious, though simple. It is applied by placing pats of neat cement in damp air for 24 hours, and then keeping some in water and others in air for 28 days. If the pats do not become distorted or darker, the cement is considered sound. But the process takes time, and the cement used is often in an imperfect condition owing to want of seasoning when it is submitted to the test. The hydration of the loosely-combined lime in the cement is necessary before testing. Accelerated tests for soundness have been made in consequence of the tediousness of the old process by cement technologists in America and Germany. The results were very conflicting. A German Society of Portland Cement Manufacturers and the Royal Testing Laboratory were long engaged investigating the subject. The results were published in 1900, but the value of these accelerated tests is denied. Mr. W. Purves Taylor, in a paper on the subject before the American Society for Testing Materials, printed in the *Engineering Record*, deals with the question, and brings it down to date. The author is the director of the Municipal Testing Laboratory of Philadelphia, and his large experience of cements gives his opinions weight. The data on which the author bases his conclusions are very perfect, and he shows that work done with cement branded as unsound by laboratory tests has given good results in practice, and shows not the remotest sign of failure. Mr. Taylor observes, in regard to the boiling test: "Of those cements passing the boiling test but one-half of 1 per cent. gave signs of failure in the normal pat tests, and but 13 per cent. showed a falling-off in strength in a year's time." From a laboratory standpoint this test is valued. Further on, however, he says: "It may often happen that a cement may pass the boiling test well, and yet check and disintegrate in the normal tests, particularly if the cement is slow-setting, high in lime, and the test made soon after the specimen is moulded." In fact, it is open to question whether the boiling test can be safely taken as a test sufficient to reject the cement. We can only refer here to the conclusions of the committee in brief. None of the so-called accelerated tests for constancy of volume is reliable in all cases. All the ten cements which withstood the pat test in the normal system of testing are practically constant in volume, when used in test pieces and cement-wares. "Until it has been possible to discover a test for soundness which is reliable, and can be carried out in a shorter time than the standard test, the 'pat test' of the normal specifications must be retained as decisive." Two years later the Society of German Portland Cement Manufacturers reported, after having made tests for the length of two years, the commissioner came to the conclusion "that none of the so-called accelerated tests, boiling tests, &c., was capable of affording in all cases a quick and reliable judgment in regard to the practical usefulness of the cement." The four years' tests made by Mr. Gary, head of the Royal Testing Laboratory,

Charlottenburg, confirm the results of the two-year tests. The paper is an elaborate one, and is illustrated by photographs of the cement specimens after undergoing the tests.

CEMENT PROFITS.

THREE cement manufacturing undertakings have recently issued their reports for the year to June 30 last, and the following is the record of profits and dividends for the past few years. The concerns in question are Joseph Robinson and Company, Casebourne and Company, and Martin, Earle, and Company, and their position is shown in the following comparison:—

Company.	1902-3.		1901-2.		1900-1.	
	Net Profit	Ord. Div.	Net Profit	Ord. Div.	Net Profit	Ord. Div.
Martin Earle.....	£. 18,179	10	£. 23,595	10	£. 19,785	10
Casebourne & Co.	2,156	5	2,833	7	1,584	4½
Robinson and Co.	2,465	5	3,450	5	1,761	5

These figures show some fluctuations, but though last year's profits are down as compared with the previous term, they are higher than for 1900-1, save in the case of Martin, Earle, and Co., which found it expedient to augment its profit and loss account by transferring £1,000 from reserve. All, however, have been able to pay dividends of a satisfactory nature. Martin Earle has only a small reserve of £1,800, and Casebourne and Co. and Robinson and Co. appear to have nothing put by for contingencies. Business varies in volume in this particular industry, and there is fierce competition.

BUILDING IN FROSTY WEATHER.

MR. GRAHAM, the British Consul-General at Stockholm, in his report, mentions that in winter one hears much about the want of employment for bricklayers and others in the United Kingdom on account of frosty weather. Yet anyone residing in Stockholm during the winter months can see bricklaying carried on in hard frost as an everyday occurrence. The art of building, the Consul-General observes, stands very high in Stockholm, much of the work done being both ornamental and of excellent quality. A few years ago a series of experiments were carried out to decide the lowest temperature at which bricklaying might be effectively carried on. Three different temperatures decided on were 23°, 14°, and 6° Fahr. The bricks and mortar were, as to quality and conditions, such as are commonly used in Stockholm. The walls thus erected during the winter were allowed to stand till the following autumn, when they were torn down and the results noted were, that those built at 23° and 14° were perfectly satisfactory, the mortar being quite hard and sound and had to be scraped from the bricks. Those laid at 6° were not satisfactory; the mortar did not adhere to all the bricks, which lay loosely imbedded in it. These results tend to prove that without any special precaution as to material or labour bricklaying can be carried on in Stockholm at a temperature as low as 14° Fahr., or 15° of frost. Generally, it may be said that the mortar should be made in a room where the temperature is kept well above freezing point. The brick used in Sweden is of a light or porous character, which readily absorbs the moisture from the mortar. Hard pressed or calcined bricks and stonework generally are not suitable for building during frosty weather, but edgings or ornaments, &c., of such material can easily be dealt with by slightly warming them before bringing them into position. This can be done by keeping them a few days in a wooden shed heated by an open coke stove. In some cases it is found advisable to cover in with rough boarding the part of the wall where such stonework is extensive; then a very small coke fire is found sufficient to keep the temperature high enough to prevent any damage to the mortar. But although brick building can thus be carried on safely under any of the temperatures already named this does not apply to plaster or cement work, which should not be done at or below freezing point, unless proper heating arrangements are made. In Stockholm 15 or 20 years ago almost all building was broken off during four or five months every winter; it is now the exception that it is hindered by frost more than a few

days or a few weeks annually. Mr. Graham sums up the matter shortly thus:—(1) The bricks should be porous and perfectly dry, that they may readily absorb the moisture in the mortar; (2) the water, sand, and bricks must all be heated.

CHIPS.

The parishioners of Hornesed, Hertfordshire, have placed a stained-glass window in the parish church, to the memory of the late rector, the Rev. George Smith. The window represents the charge given to St. Peter.

The Building Committee has reported to the Newcastle-on-Tyne Board of Guardians in favour of the entire relighting and heating of the union workhouse at a cost of £15,000, the scheme to include electric lighting and the heating of the house by hot water instead of steam. The proposals are the outcome of a report by the city engineer of Newcastle, Mr. F. J. Elgar.

The northern mun roads in Middlesex are being torn up for the construction of electric tramways. The lines have been laid down at North Finchley, and at Woodberry Down and Tottenham new rails are being laid to take the place of those used by the present horse system. The Board of Trade has sanctioned fifteen and a half miles, and the Light Railway Commissioners a further twenty-six and a half miles, the estimated cost of the forty-two miles being £1,686,255. The Middlesex County Council's whole scheme would have given the county 150 miles of tramways, but the bulk of it was withdrawn or rejected.

The town council of Huddersfield have decided to apply to the Local Government Board for sanction to borrow £7,500 for the purpose of supplying the township of Linthwaite with electrical energy.

In Glasnevin Cemetery, Dublin, a Celtic cross has been unveiled to the memory of the late Dr. Joseph Kenny, who was for many years member of Parliament for Dublin, and subsequently coroner for that city.

Major-General Oliphant, commanding the home district, unveiled on Friday in Tooling parish church of St. Nicholas a memorial, erected by public subscription, to soldiers belonging to the parish who fell in the war. The memorial, which is in the form of a tablet of white marble, is placed between the chancel and the vestry door, near the Aldous window, placed by subscription in memory of the son of Mr. Edward Aldous, rector's warden, who also fell in the war. The memorial has been executed by Messrs. Harry Hems and Sons, of Exeter.

In the case of the application on behalf of Jesse Goldsworthy (trading and described in the receiving order as J. Goldsworthy and Co.), Station-parade, Archway-road, Highgate, N., and Oak Lodge Estate, Archway-road, N., builder, the order of discharge has been suspended for three years, ending Aug. 6, 1905. In that of Henry John Gundry, Dorchester, the discharge is suspended for three years, ending August 5, 1906.

The Board of Management of the Manchester Royal Infirmary decided, on Monday, to devote the sum of £13,078, received from the Queen Victoria Commemoration Fund, to building a portion of the new infirmary as a permanent memorial of the late Queen.

The Hackney Board of Guardians have accepted a tender from Messrs. McCormick and Sons, amounting to £45,987, for the erection of schools at Ongar, Essex, to accommodate 360 of the children now under the charge of the Board. Accommodation will be provided for 300 girls and infants in six blocks to house 40 each, and the remaining 60 in cottages, where they will be trained for domestic service, the whole institution being in charge of a matron.

On Monday next there will be laid at Prudhoe-on-Tyne the foundation-stones for a new parochial hall, to be erected on a site given by the Duke of Northumberland, and estimated to be worth about £1,500. Messrs. Watson and Son, of Branch Ead, Stockfield, has secured the contract for the work, and the architect is Mr. S. D. Robins.

Mr. James Pierce Butt, timber merchant, of 21, Park Dale, Wolverhampton, died on Monday, after three months' illness, at the age of fifty-five years. The deceased, who was a native of Gloucester, had resided at Wolverhampton for about thirty years. He leaves two sons and two daughters.

In extinguishing a serious fire on Sunday morning at Messrs. Maple and Co.'s workshops, near Tottenham Court-road, the brigade was just in time to save a quantity of furniture which was in process of manufacture for the King.

The workhouse infirmary, Blackburn, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

OBITUARY.

Mr. HERBERT FORD, F.R.I.B.A. (of Messrs. Ford and Hesketh, Aldermanbury, E.C.), died on Tuesday last, after only five days' illness, at his residence, Homeleigh, South-row, Blackheath, aged 70 years. Mr. Ford, who joined the Institute as a Fellow in 1870, had for many years carried on an extensive practice, chiefly in offices, warehouses, hotels, and other commercial buildings in the City. The funeral will take place to-morrow (Saturday) at 2.30 p.m. at Charlton Cemetery.

EARLY on Saturday morning Mr. JOHN PONTON, of Warminster, a well-known local builder and contractor, was found dead at the bottom of the stairs of his house in Emwell-street, with his neck broken. It is surmised that deceased, who was 70 years of age, had gone to bed, and getting up in the night, had fallen down stairs. It was only last week that deceased had secured the contract for the building of a parish-hall at St. John's Church, and he had recently built the new Warminster county secondary day-school. He succeeded his father in the business, in which he was assisted by his son. The inquest was held on Saturday night by Mr. F. T. Sylvester, the coroner. Evidence was given by Dr. Willcox, and a verdict in accordance with the medical evidence was returned.

Mr. ARTHUR S. CUTLER, city architect of Lowell, Mass., was drowned at Stratford, New Hampshire, a few days ago. His family had been spending the summer at Stratford, and he was amusing himself by rowing on the lake, when, as is supposed, he was seized with faintness, or with some affection of the heart, and fell overboard. He was an expert swimmer, and could hardly have failed to make his way to the shore if he had been conscious at the time of the accident.

Mr. HENRY ALLEN DARROW, one of the pioneer architects of Omaha, Nebraska, died there a week ago. Mr. Darrow settled in Omaha in 1877, when the city was little more than a frontier settlement, and designed many of the principal structures which its growth has rendered necessary.

Mr. AUGUSTUS F. LASH, a person very well known to architects and builders, of Boston, Mass., died a fortnight since, at the age of eighty-two. Mr. Lash was the first man in Boston to undertake on a large scale the removal of old buildings. This has now become an important industry, employing many hands; but it was a novel business sixty years ago, and Mr. Lash and his partner long enjoyed a practical monopoly of it. During his business career he is said to have removed more than 3,000 buildings, among which were many of historical interest, such as the Wendell Phillips house on Essex-street, the Stackpole house on Devonshire-street, the Commercial Coffee House on Washington-street, and "Marm Dunlap's Store" on Theatre-alley, now a part of Devonshire-street, all in Boston.

Efforts are being made to induce the King to visit Liverpool next April and lay the foundation-stone of the proposed cathedral. The Diocesan committee, which have £175,000 in hand, are striving to increase that sum to £200,000, which is the limit they have decided upon before the stone is laid.

The new gateway at Sunderland, which has been constructed by the River Wear Commission, from the River Wear to the South Docks, was opened on Tuesday. The work is part of the great scheme of dock improvement which the commissioners inaugurated some few years ago. The gateway has cost about £36,000, and it gives a depth of water on the sill of 30ft., and is 70ft. in width, widening to 120ft.

Personal estate of the net value of £66,406 17s. has been left by Mr. James William Brooker, the elder, of Elm Bank, Vine-road, Sevenoaks, and formerly of 13, Railway-approach, Southwark, architect and surveyor. The gross value of the estate is £114,245 14s. 8d. The executrix and executors of Mr. Brooker's will are his widow, Mrs. Fanny Brooker, and his sons, Mr. James William Brooker, architect, and Mr. Frederick George Brooker, surveyor, and the testator bequeaths to Mrs. Brooker £250, a life annuity of £500, and the use and enjoyment of his house in Hitchin Hatch-lane, Sevenoaks. He leaves to his son James William two houses in St. German's-road, Forest Hill, a house at Sydenham, and land in Bevington-road, Beckenham; and to his son Frederick George the house in Hitchin Hatch-lane, subject to Mrs. Brooker's occupation thereof, and Durban House, Richmond, and the house adjoining and land there. Mr. Brooker leaves the ultimate residue of his property in trust for his children.

Building Intelligence.

BALMORAL CASTLE.—During the summer alterations have been in progress at Balmoral Castle, not of any structural importance, but having to do more with the internal economy and efficient working of the domestic side of the establishment. The architect is Sir Rowand Anderson, LL.D., of Edinburgh. Last year certain antiquated kitchen arrangements were dealt with, and a new installation of hot-water pipes to the bathrooms, &c., was introduced. This year the accommodation for female servants, which has been somewhat inadequate, has been remodelled and extended by enlarging the wing of the Castle set apart for their use. Hitherto it was two stories in height, now it is three; thereby seven large rooms have been added to those already existing, and the whole provide accommodation for over twenty female servants. Formerly the servants' rooms overlooked the garden; but in the reconstruction of the wing the rooms on all floors have been placed to overlook an open court, while the corridor giving admission to the rooms has been set on the garden side. Storerooms, bathrooms, and other modern sanitary requirements have also been introduced into this wing. Like the Castle, the new work is in grey granite, and its architectural features consist of dormer windows and massive chimney-heads. In the pediment of each dormer there is an ornamental sculptured design. That in the centre has the Royal monogram "E.R.," and the date 1903; another shows the Scottish lion inclosed in a tressure; a third a crown with the rose, thistle, and shamrock around it. Another internal alteration has been the introduction into the Castle of a luggage and coal lift, which hitherto it has not possessed. Nothing has been done to the Royal apartments or to the guest-chambers, which remain as they were in the time of the late Queen; but the Royal entrance hall has internally been considerably improved in appearance. Formerly the walls were of plain wood; now they have been panelled with the native Scottish pine grown in the Royal forest. The panelling extends to the top of the doors, and the space between it and the cornice has been left for stags' heads. Fronting the entrance is a large niche, where for many years stood a statue of Malcolm Canmore. This has been removed to the ballroom, and in its stead has been placed upon a suitable pedestal an early bust in white marble of her late Majesty, which formerly stood on a simple bracket on one of the side walls. On a panel below the pedestal has been carved "Victoria, 1819-1901," and on a similar panel over it appears the Royal monogram "E.R.," with the date 1903. An overmantel, executed in Scots pine, has been constructed over the fireplace, and in the centre is a square panel, on which has been carved a fine representation of the Royal Arms, copied from the Great Seal of Scotland, with the Scottish lion in the first and fourth quarter.

BIRMINGHAM.—At the University buildings at Bournbrook now in course of erection from plans by Messrs. Aston Webb, R.A., and Ingress Bell, the electrical power station is well advanced. Several engines and dynamos are in place, but the cables are not yet put down. In the boiler-house is to be seen a Babcock and Wilcox boiler and a locomotive boiler, and also a gas-fired superheater to give the steam additional heat after it has left the boilers, and thus obtain more work from it. Moreover, the superheater insures that the steam is delivered to the engine in a perfectly dry condition, and there is therefore no danger of water accumulating in the steam pipes. The first experiments upon the use of superheated steam, made soon after the advent of the marine steam-engine, led engineers to abandon the uses of this economical method of working, but after many years it is again coming into practice. The reason is that the materials of which the various parts of the steam-engine are made have altered considerably. The part of the engine which used to give such trouble with superheated steam was the packing round the piston-rod, which, in the early days, was made of hemp. It is now made of metal, various alloys being recommended by various makers. In all of the newly-designed electrical stations arrangements are made for using superheated steam, and in some of the older ones a saving of 20 per cent. in the coal bill has followed the fixing of the necessary apparatus.

CHERTSEY.—The chancel of Trinity Church, Botley and Lyne, has just been enriched by the

erection of a very handsome reredos, executed in Caen stone. It contains a sculptured representation of the Last Supper in high relief under elaborate canopies, flanked by four niches containing statuettes of the Four Evangelists, with their appropriate emblems; while the wings contain panels with the Ten Commandments. The style of the architecture is that of Early English, in keeping with that of the church. The floor of the Sanctuary is covered by richly-coloured inlaid marbles. There is also a new altar rail executed in oak. The sculptor was Mr. Forsyth, of London.

EDINBURGH.—During the summer vacation now drawing to a close less than usual has been found necessary in the way of structural alterations on the schools under Edinburgh School Board. For the most part the work has consisted of the annual cleaning and painting, and of the division of a number of large class-rooms into two, in order to meet the views of the Education Department that classes should be smaller. The only school in which extensive alterations are being carried on is Leith Walk School, to which another story is being added and the electric light introduced. Good progress is being made with the construction of the Boroughmuir and Broughton Second-Grade schools, the masonry of which has now reached the first-floor level. The plans of the new school in Albion-road are now before the Dean of Guild Court, and in the event of their being approved operations will be begun about a month hence.

GLASGOW CORPORATION HOUSING SCHEME.—A special committee of Glasgow Town Council has recommended that the ground, extending to over 6,000 square yards, situated on the west side of Alexandra Park, and acquired from the Parks Department four years ago for the erection of dwellings for the poorest classes, should now be utilised for that purpose. The committee, however, are of opinion that the restriction against one-apartment houses should be waived. The city engineer has accordingly prepared plans for the erection of 180 houses, 84 of which will be of one apartment, with rents of £6 5s. and under. Approval of the city engineer's proposal has been given by the special committee, and the council will be asked to proceed with the erection of the houses, on the understanding that, when erected, they will be let exclusively to persons of the poorest classes who may be displaced by the Corporation from existing unhealthy dwellings within the city, or others of that class, and, in either case, only to such tenants as are in receipt of weekly earnings of a limited amount.

LEITH.—The sub-committee of Leith Town Council on Cheap Working Class Dwellings has had under consideration a report on the subject by Mr. George Simpson, the town architect. The proposal is that two sides of the triangular area presently laid out as a garden and recreation space at Henderson-street improvement area should be utilised for the erection of these dwellings. The plans are arranged so as to provide for eight blocks towards Henderson-street of single apartment dwelling-houses. Thirty houses are provided on each flat, two washhouses, and twelve w.c.'s, entering from two common stairs, and in the event of the buildings being erected according to the plans, if three stories high, there would be 90 houses, six washhouses, and 36 w.c.'s, and if four stories high, there will be 120 houses, eight washhouses, and 48 w.c.'s. Towards Henderson Gardens the plans provide for the erection of four blocks of two-apartment houses. The plans provide for eight houses per flat, one washing-house, and six w.c.'s. If the buildings are erected three stories in height, there will be 24 houses, three washing-houses, and 18 w.c.'s; and if four stories high, 32 houses, four washing-houses, and 24 w.c.'s. The approximate cost, at 5½d. per cubic foot, of three-story and four-story blocks, is given as follows:—Three-story blocks—eight blocks, containing 90 single-roomed houses, £7,100; four blocks containing 24 two-roomed houses, £2,700—say, £10,000. Four-story blocks—eight blocks, containing 120 single-roomed houses, £9,950; four blocks, containing 32 two-roomed houses, £3,850—say, £14,000. The revenue would be for a three-story block, if fully occupied, about £3 2s. per cent. on the capital expenditure, or apart from sinking fund about four per cent., and for a four-story block about £3 6s. 8d.

HORWOOD, HEYWOOD.—The foundation stone of St. John's Church, Hopwood, Heywood, was laid by Lady Beatrice Kemp on Saturday. It

will occupy the site of a dilapidated church, and some additional ground, and will be erected from plans prepared by Mr. F. P. Oakley, A.R.I.B.A., of Manchester. The section to be erected under the present contract consists of nave and aisles up to and including the permanent chancel arch. The chancel now to be constructed is temporary only, though of good size, and built of brick, and will be replaced with a permanent structure as soon as funds allow. The church is to be faced externally with Yorkshire parpoints, with windows, copings, and other details of Sleathwaite stone. Inside, the piers of the nave and part of the arches will be of stone. The arches generally will be of red brick, and the wall's elsewhere plastered. The roof will be covered with slates. Owing to the irregular site, it was necessary to adopt an unusual type of ground plan. The nave and chancel are in line with one another along the greatest length of the site. This leaves room for a wide aisle on the north side only, that on the south side being a mere narrow passage. Arches of corresponding height to those on the arcade between the nave and the aisle form part of the south wall, and contain the clerestory windows in their upper part. The organ will be placed on a raised floor in the south transept with space for seating below. This space will for the present be used as a temporary vestry. When the church is completed the east end of the north aisle will be arranged as a morning chapel. A dwarf wall and three steps will separate the chancel from the nave, and the choir and clergy vestries will be on the north side of the chancel. The complete church will be 110ft. long and 52ft. wide inside, and will afford accommodation for 480 persons. Messrs. Blakeley and Wild, of Hopwood, are the contractors.

NEWCASTLE-ON-TYNE.—The Palace Theatre in the Haymarket was reopened on Monday after redecoration and extensive structural alterations. The scheme has been carried out from the designs of Mr. J. Walton Taylor, F.R.I.B.A., St. John-street, Newcastle, and it has been superintended by Mr. P. R. Donall, from the architect's office. In the main entrance from the Haymarket the new stairs are of marble, the dadoes are of panelled mahogany, the embossed paper harmonises with the decorative fibrous plaster design on the ceiling, a feature of which is the finely-painted panel in the centre. Clusters of electric lights have been provided. In the spacious vestibule the same scheme of decoration is carried out—heavy mahogany paneling, fibrous ceilings with painted panels, a decorated pay-office, mirrors, gold-inlaid cornices, and heavy carpets. The paintings in the ceiling panels represent the Muses, and have been carried out by Mr. Miller. The stairs and passages to the circle have been similarly treated. The interior of the theatre has been entirely redecorated and refurnished. The general scheme of colours is cream and gold. Additional stalls have been provided. The gallery has been rearranged and furnished with another exit. Ventilation has been improved by a new electric fan, and fresh fire hydrants have been fitted. The constructional work and mahogany fittings have been done by Mr. F. J. Hepple, Dunn-street, Newcastle; the ornamental copper grills by Messrs. Hardman, Powell, and Co., of Birmingham; the brass and copper handrail in entrance, marble stairs, and fire hydrants by Messrs. Emley and Sons, Ltd.

ROTHWELL, NORTHANTS.—The fine parish church, dedicated to the Holy Trinity, is now undergoing restoration, and some interesting discoveries have been made in the course of the work. The bulk of the church is Transitional, and there is reason to suspect it was once cruciform, with transepts; but these have long since vanished, possibly as a result of the restoration which gave the church its Perpendicular features. The tower stands at the west end; it suffered much from 18th-century restorers, but a fine transitional west doorway still remains. During the work now in progress a double piscina has been brought to light in the south aisle, possibly a relic of a chantry chapel which may have occupied what is now the south aisle; and the chancel contains a triple piscina, of which there is said to be only one other example in this country. The canopy of this last has long been wanting, but a crocketed canopy with a three-fold head, which is probably the missing one, has been lately brought to light. Some of the clerestory windows which have been blocked up will be reopened.

SALFORD.—The Fire Brigade is removing this

week from the inadequate premises in Ford-street to a new home in Albion-place, opposite the Technical Schools. The new building has been planned by Mr. Henry Kirkley, of Manchester, and embodies the results of a wide investigation of the fire stations of the larger towns of England, Ireland, and Scotland, carried out by the Fire Brigade Committee, assisted by Mr. Bentley, the chief officer of the brigade. The building faces north and south, the front portion directly overlooking the Crescent. The central block contains the main engine-house, a duty-room, call-room, and a tower 52ft. high for drying the hose after use. Adjoining this block is a dwelling for the use of the chief officer. To the right of the engine-house block, but separated from it by the main entrance, are a workshop, smithy, loose-box, stabling, and a spare machine-house, whilst on the left side, and behind the chief officer's quarters, is the drying-room, as well as another machine-house. Behind the front block and flanking the exercising grounds are two rows of cottages for married firemen, each of which contains three rooms, three bedrooms, and a scullery and bath. Room has also been left for an additional block of four similar dwellings. The main engine-room is 69ft. long, 35ft. wide, and 16ft. high, and will accommodate five five machines, whilst the stalls in the stables are directly behind the engine. The electric call-room and duty-room, which are separated only by a glass partition, are on the right of the engine-room, and allow of supervision from the chief officer's room. This last is an office 14ft. by 13ft., and communicates directly with the engine-room and also with the chief officer's dwelling. On the first floor over the engine-room is a parade and instruction-room, as well as the single men's quarters. Over the duty and call-room are recreation-room, lavatories, and bathroom. A novel feature in the station is a horse-bath. It is found that valuable horses are often lost after severe exertion because they catch a chill. This bath, which can be heated to any degree, will, it is hoped, prevent.

SHOTLEY.—St. John's Parish Church, at Shotley Field, Northumberland, after having undergone extensive alterations, was reopened by Mr. Lloyd, Bishop of Newcastle, on Monday. The chancel has been lengthened, and is now terminated by a pentagonal apse, containing five single-lighted windows. The organ-chamber has been built on the north side of the nave, with the vestry behind. The old vestry has been removed, as well as the entrance lobby containing the font, and the space added to the sacred edifice.

WYMONDHAM.—Good progress is being made with the restoration of the great monastic and parish church of Wymondham, one of the finest edifices in Norfolk. The church and a few outlying fragments of masonry are the only remains of the Benedictine Priory founded in 1107 by William d'Albini; but much of the existing fabric dates from 1432-5, when the present clerestory and magnificent oak roof over the nave were built, and the north aisle was widened. The work of restoration was commenced nearly two years ago, the architects being the late Mr. W. S. Hicks and his partner, Mr. W. S. Charlewood, of Newcastle-on-Tyne. The contractors were Messrs. Ruttee and Kett, of Cambridge. About £15,000 has been raised for the work, of which £12,500 was given by Mr. Willett, of Brighton, and another £10,000 is required for its completion. The beautiful roofs will be repaired, the lead being recast and relaid, and every piece of the old carved and other timbers retained as far as possible. All the floors of the church will be relaid at their original levels, the walls and windows repaired, the large west windows in the west tower and north aisle reopened, the seating improved, and proper lighting and warming apparatus provided. The east wall of the nave, which is at present entirely blank, being shut off by a brick wall from the ruined octagonal central tower, transepts, and chancel, will be beautified by the addition of a reredos of stone surmounted by a fresco. Below the sanctuary there will be carved oak choir and clergy stalls, and also a chancel organ. The arch dividing the west tower from the nave will be opened up by the removal of the modern gallery and partition. The organ, presented in 1793, must be rebuilt and enlarged, and will then be placed on a screen under the west tower under a new vaulted groined ceiling (the original corner fan-shaped springers being still in existence). The choir vestry will be built on old foundations, and a clergy vestry built in the base of the eastern or abbey tower, to preserve

the ancient north and south doorways, as well as the doors from the sanctuary, which were bricked up, and will be reopened. There are five bells in the west tower, but they have not been rung within the memory of man owing to their unsafe condition. The tenor weighs 25cwt., and is of fine tone, the second bell is cracked, and must be recast. The remaining bells are also out of repair, the frame is decayed, and the ringing tackle has ceased to exist. Mr. Crosier Bailey and his brothers have undertaken to restore this old peal to life, and to give three new bells, thus adding another complete peal of eight to those already existing in Norfolk. This work is being executed by Messrs. G. Day and Son, of Eye, and Messrs. Mears and Stainbank, of London. Entirely new floors and steps in the west tower are necessary. The ground around the church will be lowered. The architect's report divided the work into sections. The work which has been accomplished up to the present includes the restoration of the roofs, and the windows, walls, and floors of the nave and south aisle, the west end of the church has been opened out, whilst the eastern, or abbey tower, has been preserved. Moreover, on September 30 the dedication of the new bells will take place.

CHIPS.

The formal opening of the new Bo'ness Academy, which has been constituted a higher-grade school, took place on Tuesday. The Academy occupies a commanding site immediately to the east of the Bo'ness Public School. Accommodation is provided for 360 scholars. All the classrooms open from a large central hall intended for physical exercises and the teaching of free arm drawing. One of the classrooms is fitted up as a science-room and chemical laboratory. The cost, including the furnishings, was about £7,000. The architect is Mr. Alexander Callier, of Hamilton, whose plan was chosen in competition.

The attention of the War Office has been called to an architectural disfigurement of Hampton Court Palace by the reconstruction of chimney-stacks on the barrack buildings with yellow bricks, which do not harmonise with the Palace brickwork.

The Duchess of Albany has consented to lay the memorial-stone of the Royal Waterloo Hospital for Children and Women, which is being rebuilt on an extended site at the corner of Waterloo and York roads, S.E., on Thursday.

The committee of the Dean Howell Welsh National Memorial Fund have decided, after consultation with public men throughout Wales, that the form of memorial which would have most warmly commended themselves to the late dean would have been:—(1) The restoration of the roofless chapel of St. Nicholas, in the cathedral church of St. David's, where his remains are interred; (2) the foundation of a David Howell theological scholarship. For the restoration of the chapel at least £1,500 will be required.

The opening of St. Paul's new Congregational Church, Wigan, took place on Friday. The new church, which is Early English in style, and has a spire, occupies the site of the old structure in Standishgate, with extensions in the rear. It provides accommodation for 750 persons, and the cost amounts to about £6,000, the architect being Mr. F. W. Dixon, of Manchester, and the contractors Messrs. J. Wilson and Sons, of Wigan.

The new Kincardineshire isolation joint hospital, which has been built near the railway station at Stonehaven at a cost of about £8,000, was formally opened on Saturday by Sir Alexander Baird, Bart., Lord Lieutenant of the county.

Colonel W. R. Slacke, R.E., held a Local Government Board inquiry at Hull on Wednesday, Thursday, Friday, and Saturday in last week respecting an application made by the Hull Corporation for power to borrow £47,350 for establishing a municipal telephone system in Hull and district.

Mr. W. W. Stevenson, of Bermondsey, a guardian of the St. Olave's Poor Law Union and the secretary of the United Builders' Labourers' Union, has been selected to contest South Hackney at the next Parliamentary contest in the labour interest.

At the Guildhall, Grantham, on Tuesday, an inquiry was held by Mr. J. Stewart, R.E., one of the Local Government Board inspectors, relative to the application of the Grantham Corporation for powers to borrow £3,800 for the purpose of purchasing land adjoining the river Witham on the Belton-lane, and the erection thereon of a refuse destructor and steam disinfecter.

The Local Government Board has sanctioned an additional loan of £21,000 to the Morecambe Urban District Council, for the purposes of sewerage and sewage-disposal.

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WESTERN DISTRICT HOSPITAL, GLASGOW.—ST. JAMES CHURCH AND VICARAGE, CARDIFF.—HOUSE AT NEAR CROSS, STAFFORD.—NEW INLAND REVENUE OFFICES, READING.—PRINCES' PARADE, BRIDLINGTON.—NURSES' HOME, NORTH STAFFORDSHIRE INFIRMARY.—GERMAN OLD FURNITURE.

Our Illustrations.

WESTERN DISTRICT HOSPITAL, GLASGOW.

This building is in course of completion at Oakbank, in the western district of the City of Glasgow, and forms part of the new scheme of hospital accommodation presently being provided by the parish council. The hospital is planned for 205 patients, made up as follows:—Receiving block, 6; medical block, 112; surgical block, 50; maternity block, 37; total, 205. Owing to the restricted width of the site, the problem of placing the several blocks on the ground, so as to meet the requirements of the Local Government Board, presented considerable difficulties, and the plan shows how these have been overcome. The walls are built of brick, having a 2½ in. air space between the outer and inner facing. The floors throughout are of fireproof, consisting of steel joists and fireclay tubes; the flooring of wards being of maple, waxed and polished, and the passages paved with terrazzo. The walls and ceilings are plastered with Keene's cement, all the angles, both internal and external, being rounded. The walls of the sanitary annexes are lined with white glazed tiles, and the floors of bathrooms are paved with indiarubber interlocking tiles. The hospital is lighted by electricity, and the hoists are worked by electric motors. The wards are heated partly by heating elements in the basement, where the air is washed and then driven into the several wards by electric fans, and partly by radiators placed in the wards directly over the air inlets, so that the temperature of each room could be regulated. The foul air is extracted by means of special outlet shafts constructed alongside the smoke flues. Throughout, the hospital is being equipped in the most approved manner, and it is intended that the institution will be ready for opening by the end of the present year. The architect is Mr. Alex. Cullen.

ST. JAMES'S CHURCH AND VICARAGE, CARDIFF.

Our illustration shows the first design submitted for the church and vicarage by the architect, Mr. E. M. Bruce Vaughan; but the committee adopted an Early English design, which has been erected at a cost of £10,000, which has been carried out under Mr. Bruce Vaughan's superintendence.

HOUSE AT NEAR CROSS, STAFFORD.

This small house has recently been erected at Near Cross, Staffordshire, for Mr. C. F. Jenkin, by Mr. Henry Lovatt, of Wolverhampton, from the designs of Mr. C. Stanley Peach, 28, Victoria-street, Westminster. It contains, on the ground floor, one large room 30ft. by 20ft., a drawing-room and a laboratory, each 22ft. by 14ft., and a schoolroom 18ft. by 14ft., and the usual offices. On the first floor are eight bedrooms, and in the roof are two good-sized attics. The windows to

the south front are shielded by shutters and a verandah. The walls are rough-cast throughout, with the exception of a plinth faced with 2½ in. red bricks. The roof is tiled. The perspective drawing is by Mr. S. D. Adshead.

NEW INLAND REVENUE OFFICES, READING.

This building has been erected at the corner of Friar-street and Station-road, Reading. The major part of it has been taken by H.M. Government for the purpose of Inland Revenue Offices. The materials used are local bricks, Portland stone dressings, cornice, &c., and American green slates. Messrs. Wheeler Bros., of Reading, were the contractors for the block. The architects are Messrs. E. B. Hoare and M. Wheeler, of 11A, Orchard-street, Portman-square, and Reading.

ROYAL PRINCES' PARADE PAVILION, BRIDLINGTON.

The Corporation of Bridlington propose extending the Princes' Parade northwards and erecting thereon a new pavilion to accommodate about 2,000 persons. The building is octagonal, and has a raised gallery internally on the western side facing the sea. It is inclosed all round. Three sides are glazed, and there are four entrances, each provided with swing doors. The roof is largely constructed of wrought iron with rough plate glass, and in the centre of the roof there is a large dome 57ft. by 45ft., constructed of wrought iron principles resting upon an octagonal lattice girder supported by a cast iron column having ornamental cap, the dome being surmounted by an octagon lantern light prepared for ventilation. An open verandah, 6ft. wide, with glass roof runs round three sides of the pavilion, and the floor of the pavilion is laid (where not appropriated by raised gallery) with wood-block paving, and contains a raised platform capable of holding forty musicians. On the north side of the pavilion are four bijou shops, and on the south side provision is made for one bijou shop and a refreshment-room 35ft. by 31ft., with kitchen and lavatories for assistants. The roof over refreshment-room and shop is flat, formed with concrete and Val de Travers asphalt, so that it can be utilised for refreshments, and is approached from the refreshment-room by a staircase. Messrs. Mangnall and Littlewoods are the architects.

NURSES' HOME, NORTH STAFFORDSHIRE INFIRMARY, STOKE-ON-TRENT, STAFFORDSHIRE.

The drawings which we publish of the above were those placed first by the assessor, Mr. H. R. Price, of Manchester. Thirty-eight sets of drawings were submitted in open competition, and Mr. R. Stephen Ayling, F.R.I.B.A., and Mr. A. R. Piercy were the successful competitors. The foundation-stone was laid by the Rt. Hon. the Earl of Dartmouth, R.W.P.G.M. of Staffordshire on Oct. 24, 1902, with full Masonic ceremonial, and the building is now nearing completion. It contains accommodation for 52 nurses and sisters, with large sitting-rooms, library, servants' rooms, sickrooms, &c. The necessary funds were obtained by subscription, H.M. the King heading the list with a donation of £105. Local contractors were invited to compete for the work, and the lowest tender was received from Mr. John Bagnall, of Fenton, at the sum of £5,407, in whose hands the contract has been placed. A covered way is proposed from the present infirmary to the new home. Among the sub-contractors are:—Fireproof floors, Messrs. Mark Fawcett and Co. The materials generally are local red bricks, with Hollington stone dressings and red-tiled roofs.

GERMAN OLD FURNITURE.

There is not much to say about these capital pieces of old furniture, chiefly of the 16th or early 17th century date. We are enabled to illustrate them through the courtesy of Mr. Wm. Flockhart. The originals are preserved in the Louvre at Paris.

The members of Colwyn Bay Urban District Council have received from the Local Government Board sanction to purchase the Glan Abet and Rhianfa property as a site for a town-hall and public offices.

The foundation stones of a new Wesleyan Chapel, which is to be erected at Kirton Holme, Lincolnshire, were laid on Thursday in last week. Mr. W. Hinson, of Stamford, is the architect, and Mr. Baker, of Moulton Chapel, the builder, and the cost is estimated at £600. The building will be 39ft. by 29ft., the internal fittings and seating will be pitch-pine, and there will be accommodation for 165 adults.

COMPETITIONS.

HARROGATE.—A new pump-room for the old sulphur spring is about to be erected at Harrogate, at the end of the Valley Gardens, facing the present pump-room, on the site of Rose Villa. The corporation are intending to erect an iron-and-glass building, limiting the scheme to proposals by east-iron trading firms, so that architects will not be invited to submit designs. The excuse for this shortsighted method of proceeding is due to the obvious necessity of not excavating much beyond the surface for foundations in case the course of the springs should be injured or interfered with. The town is singularly devoid of buildings of architectural distinction, and it is a matter of regret that this opportunity of adding to the dignity of this eminently prosperous watering-place has not been made the most of, by erecting a stone pump-room, instead of running up a floric glass-and-iron shelter of the usual manufacturers' type of stock patterns. It would have been perfectly easy to carry a substantial structure in masonry on a raft of iron and concrete, without tampering with the subsoil or its springs; but the authorities, taking their own view of the matter, have decided on the course indicated. We cannot contemplate the result with any degree of satisfaction.

STONE, STAFFS.—The board of guardians have invited Mr. T. H. Fleeming, architect, of Wolverhampton, to act as assessor for the competition of local architects for adding vagrant wards to the workhouse, of which we gave particulars last week.

CHIPS.

Memorial stones of a new Wesleyan chapel were laid at Belfot on Thursday in last week. Mr. Greenfield is the architect.

Messrs. Wm. Potts and Sons, clock manufacturers, Leeds and Newcastle-on-Tyne, have just erected a new Cambridge-quarter chime clock at Ballincollig parish church, Ireland, showing the time upon four large illuminated dials, with all Lord Grimthorpe's latest improvements inserted. They are also erecting one at Keighley parish church, Yorkshire, for Mr. Joseph Greenwood, Keighley, on Lord Grimthorpe's designs and plans.

The new St. Mary's Episcopal Church at Kirriemuir is about to be erected, replacing an edifice in which the congregation worshipped for over a century, and which was destroyed by fire early last year. Plans for the new church have been prepared by Messrs. Bucknall and Comper, architects, Westminster, and will involve an expenditure of £3,000. Of this sum £1,540 has already been obtained by subscriptions and grants from the Walker Trust.

The Wetherby Rural District Council have decided to apply to the Local Government Board for a loan of £4,000, for the drainage of Bramham.

The urban district council of Rothwell, Northamptonshire, have appointed Mr. T. C. Betts, assistant to the late officer, to the position of surveyor and inspector of nuisances in succession to Mr. W. T. Pearson.

Mr. Wm. Brooke, of 11 Hill Top House, Lightcliffe, near Brighouse, the manager of the Non-Ship Stone Works in that village, was killed on the railway line near Lightcliffe station on Friday. The deceased, who was 38 years of age, leaves a widow and a young family.

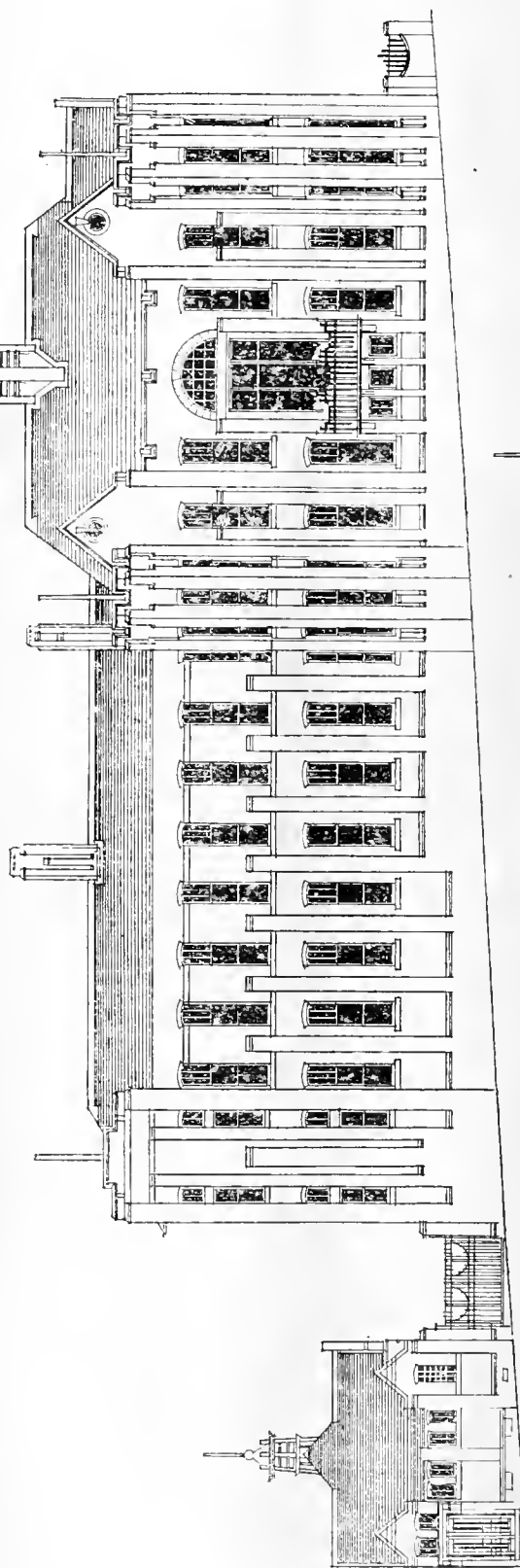
A Local Government Board inquiry was held at the Sessions House, Dartford, on Thursday in last week into the application of the joint hospital Committee of the urban and rural councils for sanction to borrow £7,748 for the extension of the infectious hospital. Originally, the estimated cost of the work was £7,000, but the requirements of the Local Government Board had increased it to £11,150. The Board has already sanctioned the borrowing of the sum of £3,402, that being the cost of the land and the erection of a boundary wall, and the difference between that amount and the total estimated cost was the subject of the application.

On the site of the mansion in which John Bright was born, the Technical Education Committee of Rochdale are about to build a new school for 400 children and 200 infants.

Mr. H. J. Reay, road surveyor under the rural district council for Brampton, Cumberland, has just been appointed divisional surveyor under the Hertfordshire County Council for the Hertford district.

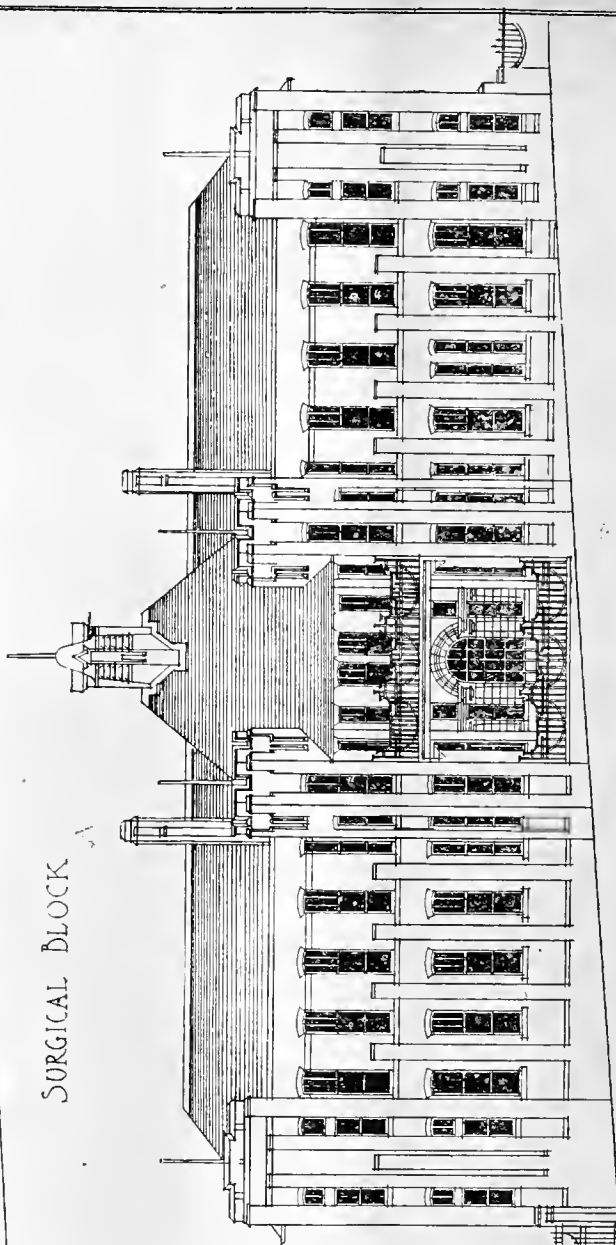
The will of Mr. William Joseph Thompson, aged seventy-nine, of Clark House-road, Sheffield, engineer, lately engaged on the widening of the Midland Railway and formerly on the Leeds Waterworks, has been proved for £60,355.

PARISH OF GLASGOW :
WESTERN DISTRICT HOSPITAL AT OAKBANK



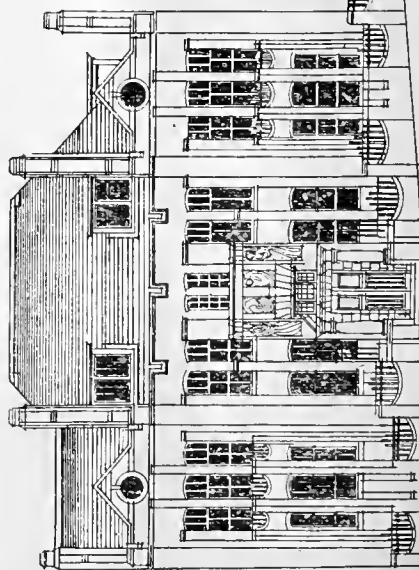
MORTUARY BLOCK

SURGICAL BLOCK



WATERNITY BLOCK

ALEX COLLEN ARCHT

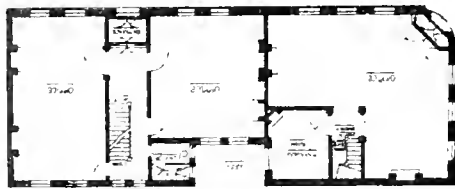
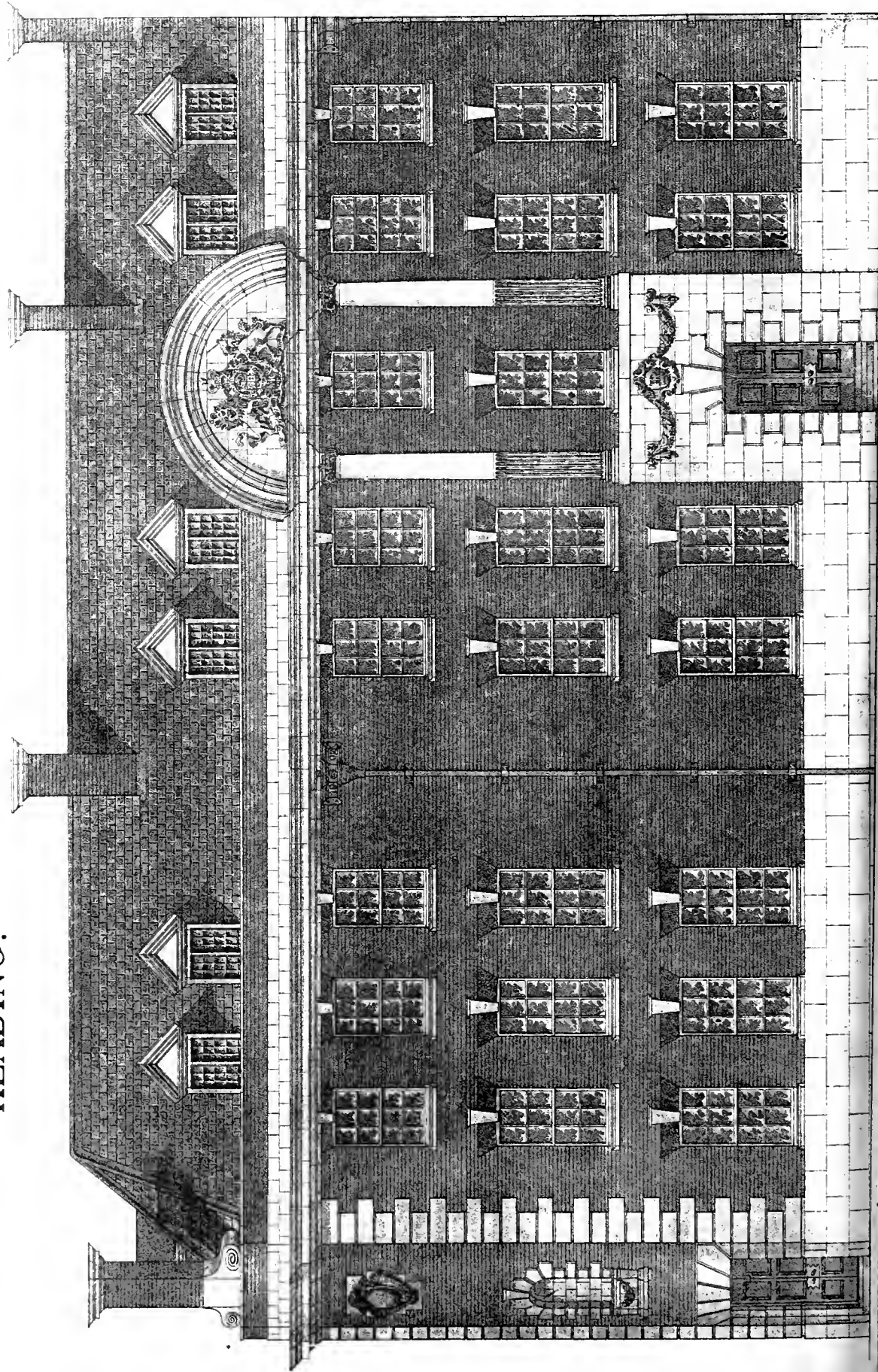


ADMINISTRATIVE BLOCK

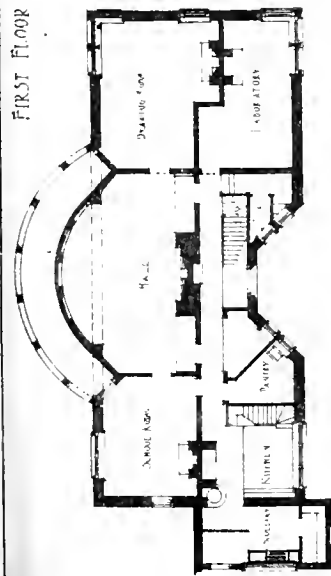
THE BUILDING DEWS, SEPT 4, 1903.

NEW INLAND REVENUE OFFICES &c., READING.

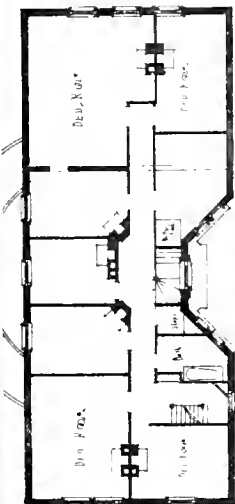
MESSRS HOARE AND WHEELER ARCHT



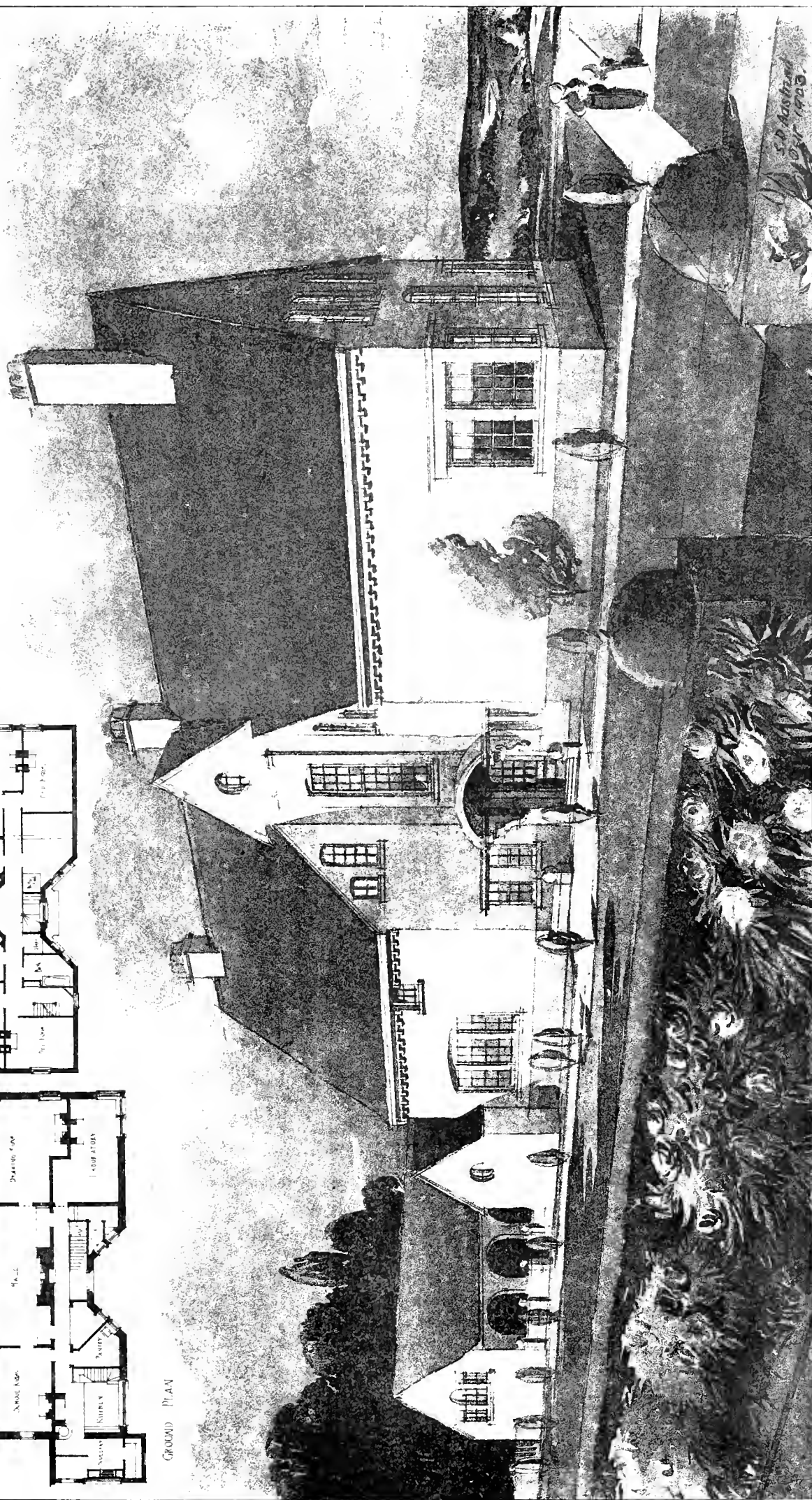
GND FLR PLAN



GROUND PLAN

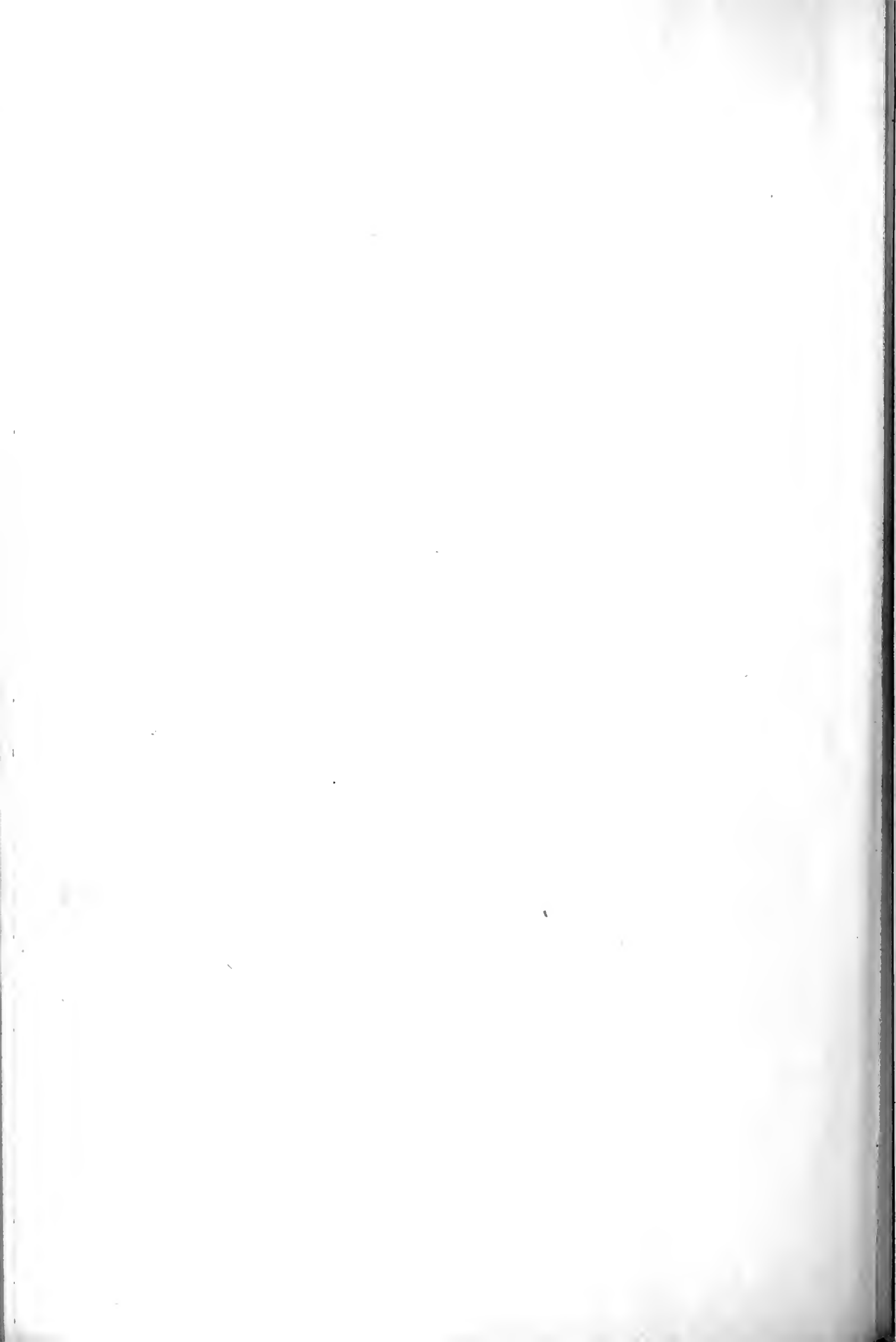


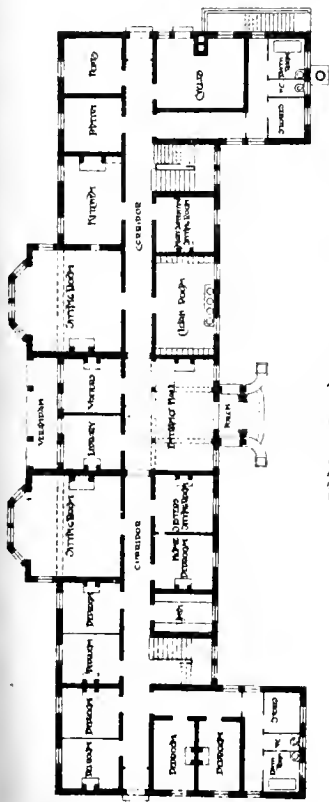
FIRST FLOOR



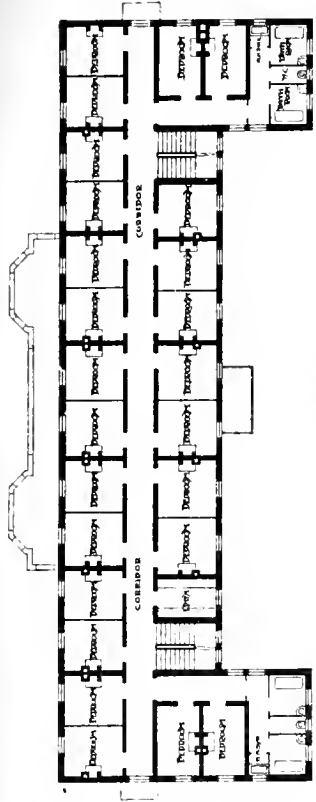
"PHOTO TINT" BY ALMA ALKEMAN, F. ALKEMAN, JUNIOR, LONDON, W.

NEAR CROSS, NEAR STAFFORD • MESS^{RS} PEACH AND REILLY ARCH^{TS}

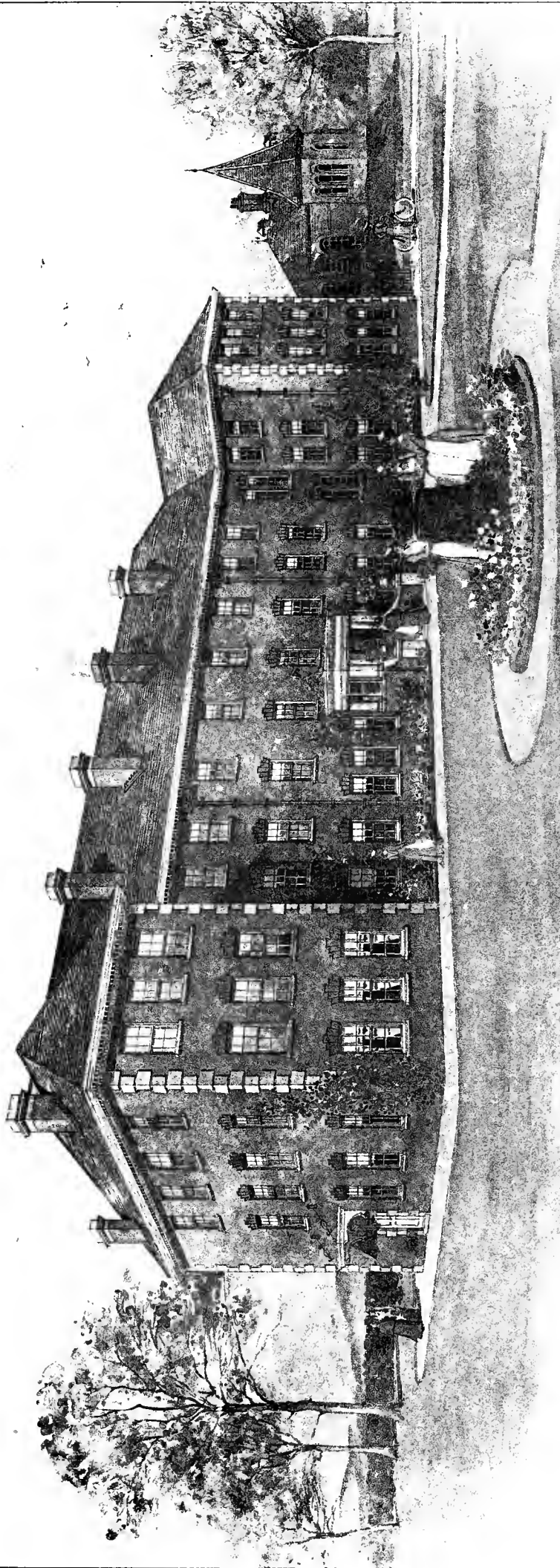




PLAN OF GROUND FLOOR



PLAN OF FIRST AND SECOND FLOORS



NURSES' HOME
NORTH STAFFORDSHIRE INFIRMARY

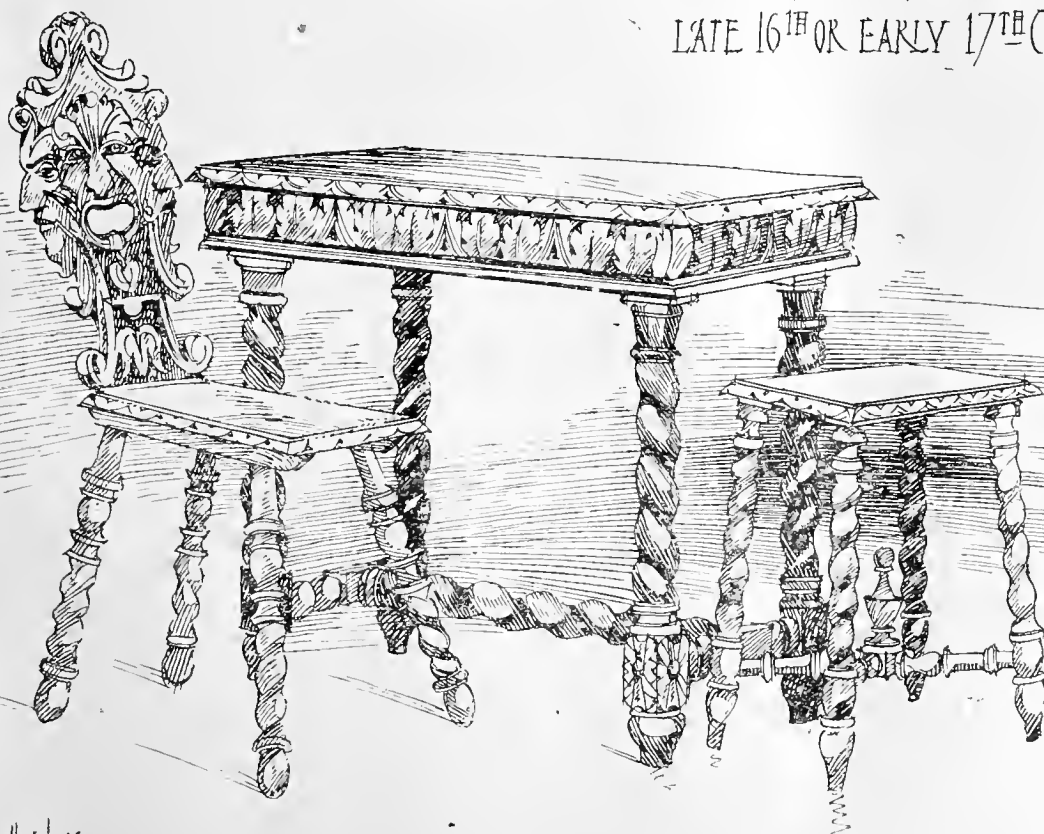
R. STEPHEN AYLING, F.R.I.B.A. } ARCHITECTS
A. R. P. PIERCE }



CARVED TABLE AND CHAIR GERMAN
LATE 16TH OR EARLY 17TH CENT^Y



TABLE CHAIR AND STOOL GERMAN
LATE 16TH OR EARLY 17TH CENT^Y



Engineering Notes.

WIDENING WORKS AT EASTON.—By permission of Mr. E. H. Thornhill, the chief engineer, the members of the Civil and Mechanical Engineers' Society inspected on Saturday afternoon the widening works which have been undertaken by the London and North-Western Railway Company near Easton. Good progress has been made with the scheme, which was commenced two years ago. The ground, upon which hundreds of workmen are now engaged, was at one time covered by row on row of poor-class dwellings. All these have had to be bought up and new homes found for the tenants—no easy matter in so congested a district as that between Easton and Camden Town. Three thoroughfares have disappeared—namely, Mornington-street, Stanhope-street, and Serpentine-road. The aim of the new works is to provide accommodation for housing and shunting passenger coaches close to Easton. Near Mornington-crescent a large space has been cleared, and when the necessary excavations have been finished, sheds are to be erected in which there will be space for 350 coaches, while there will be room for more on the sidings near by. These sheds will be reached by a subway which is being driven under the main line. In addition, a tunnel is being constructed through which engines can be run out towards Chalk Farm. These operations cover an area of about 5,000 square yards, and have necessitated 450,000 cubic yards of excavation. All this earth is taken out by truck to Willesden, where it is being formed into a bank, on which a goods siding will be made. Masonry retaining walls have to be built round the space for the carriage sheds and sidings, to support roads and property in the vicinity. It is expected that all will be completed by the end of next year. The contractors are Messrs Joseph T. Firbank (Limited).

GOSFORTH AND PONTELAND LIGHT RAILWAY.—Good progress is being made with the light railway some seven miles in length from Gosforth to the village of Ponteland, by the North-Eastern Railway Company. The contractors are Messrs. W. and J. Lant, of Newcastle. The line branches off westwards from the Blyth and Tyne section of the North-Eastern Railway at Gosforth Colliery Junction, and at Cooledge passes under the turnpike road by a girder bridge of 30ft. span and 30ft. in width. There are intermediate stations at Cooledge, Fawdon, and Callerton. The line will be a single one.

RUNCORN.—A transporter bridge is being constructed across the Mersey between Widnes and Runcorn, from plans by Mr. John J. Webster, M.Inst.C.E. The bridge is in design similar to an ordinary stiffened suspension bridge, with the exception that the approaches to the bridge are at a low level—thus dispensing with the very costly high-level approaches—and the traffic, both foot and wheel, is carried over in a car suspended to the underside of the bridge. The arm is 55ft. by 24ft. wide, and can convey at each journey four two-horse waggons and 300 passengers. The twin towers on either shore are constructed of steel, and rise 190ft. above high water level, and are bolted to the cast-iron cylinders below, which in turn are secured to the solid rock. The two main cables each consist of 19 steel ropes bound together, each rope being 12in. in diameter, and built up of 127 wires. The clear span is 1,000ft. The total cost will be £130,000. Mr. L. H. Chase is the resident engineer. The construction of the steel cables was let to the St. Helens Cable Company. The whole of the electric installation and equipment, including the lighting of the structure, is being carried out by Messrs. Mather and Platt, of Salford Ironworks, Manchester.

THE CHESTER AND HOLYHEAD LINE WIDENING.—The London and North-Western Railway Co. are making good progress with their scheme for widening their Chester and Holyhead line between Chester and Llandudno Junction. The first section of the duplication of the railway is virtually completed. This includes the widening of the line from Chester General Station by the Roodeo to Saltney Junction with the Great Western Railway—a heavy piece of work, involving much deep rock cutting and the widening of the Dee Bridge. From Saltney the line is quadrupled to a point about half-way between Queen's Ferry and Connah's Quay. Though some work is in progress in between, the line is not quadrupled again until about half-way between Bagillt and Holywell, whence it is com-

pleted to Abergele. There is heavy bridge work over the Foryd at Rhyl, and a new station at the latter place. A new station has been made at Talacre, on the line between Mostyn and Prestatyn, the first point where the line nears the sea after leaving the estuary of the Dee. Some of the stations have an extra island platform, whilst others have through running lines in the middle of them. The next portion of the widening is to begin at the west end of the tunnel at Llysfaen—that is, Old Colwyn station—and the track is already fenced off in places on the land side. Work of an important kind has been begun at Colwyn Bay station. The old ballast pit, which is such an eyesore to the town, is being converted into a goods yard and goods station, and the approaches are well in hand. When this is completed the present goods yard will become part of the new lines. From Colwyn Bay to Llandudno Junction the work is so far advanced that the permanent way will be laid before long. There are several over-bridges to be completed, one being at Mochdre station, where a level crossing is being abolished. Of the under-bridges the most important is one opposite the Colwyn Bay Hotel. A few months will see this section of the line completed between Colwyn Bay and the Junction.

CHIPS.

Dr. Wheaton, Local Government Board inspector, held an inquiry at the union offices, Leigh, Lancs., on Tuesday, into the joint hospital board's application for sanction to borrow £1,540 for extensions at the Astley sanatorium.

Extensions to the St. Helens Hospital are now being carried out. The contract has been let to Mr. Fred. Brown, of St. Helens, for the sum of £13,269. The plans, providing for increased accommodation up to ninety-seven beds, have been prepared by Messrs. Briggs and Wolstenholme, and the possibility of future extensions has been kept in view.

Holy Trinity Church, Southport, standing in one of the oldest churchyards of the town, has been for some time considered unsafe for the congregation to meet in, and services consequently have been held in the schoolroom. The fabric is now being taken down with a view to another church being erected on the same site.

The Forbes Riding School, Newcastle-on-Tyne, has been removed from the Northumberland-road Yeomanry headquarters to new premises in Sandyford-road, in that city. The new buildings have been erected from designs by Mr. Rich, architect, of Newcastle. There are the executive rooms—office, dressing-rooms, harness and saddle-rooms, &c.—a riding-hall 130ft. in length, overlooked by a gallery, and at the further end stabling accommodation. Outside there is a run of some 200ft., which will be available for the training of volunteer artillery and exercises for horse artillery.

At Tuesday's meeting of the Leith Corporation it was decided to purchase the local section of the Edinburgh street tramways. The expected purchase price is £10,000. The tramways, which are still worked by horse traction, belonged to the original Edinburgh Company, but when the Edinburgh Corporation took over the city tramways and converted them into the cable system Leith refused to purchase their section, and hold a working arrangement. The corporation of Leith will doubtless electrify the system.

A new frontage is to be built at the Victoria Station, Manchester, and the work has been already begun. It is the intention of the Lancashire and Yorkshire Railway Company to set up a block of buildings which will extend from Long Millgate to the present refreshment-rooms at the top of Hunt's Bank. The buildings will harmonise, architecturally, with the present offices in Hunt's Bank and Victoria Parade. The ground floor will be arranged for the general accommodation of passengers, and there will be offices in the higher stories for head officials of the company.

The formal opening took place on Thursday in last week of the Glossop electric tramways. The lines at present opened connect Glossop with Uddingfield by way of Dinting, and the length of this proportion of the track is 3½ miles; there is also a short branch line ½ mile long to Whitfield.

Reopening services will be held on Sunday next at Trinity Presbyterian Church, Cloughton, Birkenhead, after redecoration and the insertion of stained-glass memorial windows. The windows and general decorations, with the exception of one window, were designed and executed by Messrs. J. and W. Guthrie and Andrew Wells, Ltd. (Glasgow), Mr. John Russell (Birkenhead) being the contractor for the painting. The other window was designed and executed by Mr. Arthur Dix, of Berners-street, London. The ceiling and woodwork were carried out by Mr. W. H. Forde, Birkenhead.

PROFESSIONAL AND TRADE SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Ten of the members of this society visited Ashbourne, in Derbyshire, on Saturday, Aug. 15. Almost continuous rain prevented much outdoor sketching. Fortunately, the interior is very interesting, including some good Early English windows and decorated work and some fine tombs. The curiously irregular transeptal plan, with chapels, gives some very picturesque vistas internally, and a long day's sketching proved all too short. On the evening of Aug. 25, fifteen members visited Parr's Bank, Spring-gardens, by the kindness of Messrs. C. Heathcote and Sons, the architects. Mr. Heathcote, jun., explained the building to the visitors, and the visit was a very interesting one.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The new session of the Royal Institute of British Architects will be opened on Monday, November 2, when the President, Mr. Aston Webb, R.A., will deliver an address. The subsequent meetings of the Institute will be held on Nov. 16 and 30, Dec. 14, Jan. 4 and 18, Feb. 1, 15, and 29, March 14 and 28, April 18, May 2 and 16.

SANITARY INSPECTORS' ASSOCIATION.—On Saturday a number of the members of the Sanitary Inspectors' Association left London on a fortnight's tour through Belgium, and also with the intention of taking part in the Eleventh International Congress at Brussels, which opened on Wednesday of this week. The visits will include several hospitals, the quays, and docks, the northern pumping station, &c., at Antwerp; the abattoirs in the Boulevard d'Anderlecht, and other sanitary works of interest in Brussels; and the Waterloo battlefield.

Plans and estimates are being prepared for the Keighley Town Council with a view of reconstructing and electrically equipping the existing tramway, and for the construction of a new electric tramway between North-street and Stockbridge, by way of Cavendish-street and Bradford-road.

The work of laying the mains in connection with the supply of water to Studley, Warwickshire, has now been completed, and the final testing of the mains and hydrants took place on Tuesday by Mr. Gander, the district council's surveyor.

The Basford Rural District Council have decided to adopt a scheme of drainage for Barton Joyce at an estimated cost of £5,000.

The Earl of Coventry laid the foundation-stone of the new Worcestershire County Lunatic Asylum near Bromsgrove yesterday (Thursday).

Operations were begun on Friday in connection with the laying of rails for the tramways at Coatbridge, N.B. A start was made near to Hutton-street, and double rails will be laid eastwards. Messrs. Dick, Kerr, and Co. are the contractors, and already a gang of over sixty men are at work. Lining has been granted for the erection of the tramway sheds in Jackson-street, the estimated cost being £3,500.

Mr. M. K. North, Local Government Board inspector, held an inquiry at Aldridge on Friday into an application by the Walsall Rural District Council for sanction to the borrowing of £1,500 for the purpose of extending the present sewerage system. The surveyor (Mr. F. W. Mager) explained that the parish had a population of 2,478. The extension of the sewers has become necessary owing to recent building operations.

The Furniture Trades' Provident and Benevolent Association has been formed, with Mr. Samuel J. Waring, jun., as president, supported by a board of management composed of many of the leading representatives of the trade in all parts of the country. A festival dinner will be held at the Criterion Restaurant on Nov. 14 in aid of the association's funds. The offices of the association are at 250, Finsbury Pavement Hoase, E.C.

Mr. Maurice Fitzmaurice, C.M.G., chief engineer of the London County Council, who has been inspecting public works in the United States, sailed for England on the *Umbria* on Saturday. Before leaving he spoke in high praise of New York's subway operations. "New York," he said, "is ahead of London in subway matters."

The opening of the group of cottages which the miners of the Cowpen group of collieries have erected as a memorial to the memory of their late employer, Mr. G. B. Forster, was carried out on Saturday afternoon. The cottages, eight in number, are situated near Cowpen Colliery, and have cost £1,400.

Mr. E. Wareham Harry, the borough engineer and surveyor of Cambridge, was thrown out of his trap in Sidney-street in that town on Monday, and had one arm broken and the other badly hurt.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LIII., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation advertisements must be prepaid.

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Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—G. B. and Co.—R. M. M.—W. A. A.—P. L. M.—J. B. and Co.—T. W. C.—A. A.

"BUILDING NEWS" DESIGNING CLUB.

SEVERAL correspondents have inquired when the New Season will commence. The awards will be published by the end of the month, when the first subject will be given.

Correspondence.

OUR DESIGNING CLUB AND ITS COMPETITORS.

To the Editor of the BUILDING NEWS.

SIR,—I have several times thought of expressing my indebtedness to the BUILDING NEWS Designing Club. An incident to-day has decided me to do at once, for, in turning over some old papers, I came across your award in such Club for 1881, there, towards the bottom of the list of those whose efforts called for recognition that year, my name appears; while the name at the top, as winner of the first prize, recalls some pleasant days spent as junior at a drawing-board alongside you. Am pleased the Club is so well sustained, and evidently, by your awards and published

plates, continuing its splendid work for rising students.—I am, &c.,

WILLIAM LUCAS.

Lyle's Chambers, Church-street, Pietermaritzburg, August 4.

[We are very pleased to receive this letter, and to publish in another column the particulars of the big job our correspondent has in hand. All prosperity to him and every other old BUILDING NEWS Designing Club-man.—Ed. "B.N."]

Intercommunication.

QUESTIONS.

[12300.]—Supporting Tank.—I have to fix a 900-gallon galvanized iron tank 14ft. above the ground and propose carrying it on three steel girders resting in the house wall, which is 2ft. thick, of stone, and on a 9in. brick wall forming a passage 3ft. 6in. wide between it and the house wall. The brick wall built in has mortar is only 8ft. high; it will, therefore, under tank, have to be carried up in the form of a pier 7ft. high, 7ft. long, and 9in. thick. Is this supporting wall sufficiently strong to carry its proportion of the tank and contents?—BUILDER.

[12001.]—Borton Church.—While cycling through Norfolk on my holidays, I came across a very handsome modern church at Borton, about twelve miles north of Norwich. It is decorated in style, and the windows are of great beauty. If readers could refer me to back numbers, or other sources, giving information or illustrations of it, I should be much obliged.—D. W. CLARK.

LEGAL INTELLIGENCE.

A SARDINIA-STREET ARBITRATION.—Sir John Wolfe Barry has issued his award as umpire in the arbitration which has recently been held to determine the amount to be paid by the London County Council to the Metropolitan Electric Supply Co., Ltd., for the compulsory acquisition by the Council of the company's generating works at Sardinia-street, Lincoln's Inn-fields. The London Improvements Act, 1893, provided that, in addition to vesting in the company a new site of equivalent area to their present one, the Council were to pay to the company a sum equal to the costs and expenses of erecting and fitting up a new generating station upon a new site, with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and all expenses incurred in replacing, relaying, and altering mains. The amount of the award is £183,150.

THE MURAL AND DECORATIONS SYNDICATE, LTD.—A summary of accounts of the Mural and Decorations Syndicate, Ltd., in liquidation, together with some observations upon the affairs of the company, have been issued by Mr. H. Brougham, Official Receiver. The deficiency with regard to creditors is returned at £18,603 11s. 8d., and, with regard to contributories, £28,650 11s. 8d. The Official Receiver states that the company was incorporated on March 23, 1893, with a nominal capital of £25,000, to acquire and extend a branch of the business carried on in the style of the Mural Decorations Co., at 50, Milton-street, City, and at Kingston-on-Thames. No remuneration was paid to any of the directors, with the exception of Sir George Thomas, who received £15 per month as deputy managing director, and Mr. Charles Petri, who received a salary of £390 per annum as managing director. The trading of the company appears to have resulted in a large loss, and on January 29, 1902, a resolution was passed to the effect that the company was unable to meet its indebtedness, Sir George Thomas being appointed receiver for debenture holders. The failure of the company was attributed to want of working capital, and to liability under an award given against the company in an arbitration arising out of a contract between the company and a builder. The liquidation is in the hands of the Official Receiver.

A SPALDING ARBITRATION AWARD.—The arbitrator (Mr. W. Scorer, of Lincoln) has given his award in the case of J. R. Baker, builder, of Moulton Chapel, Spalding, v. F. Neal, farmer, Mill Green, Spalding, which was entered for Lincoln Assizes. The claim was for £100 due under a contract for the erection of a house, but the defendant alleged unreasonable time taken, defective work, and entered a counter-claim of £50 for extra work and inconvenience. The arbitrator awarded Mr. Baker £39 is., and disallowed the defendant's counter-claim.

RE R. BANNER OAKLEY.—The adjourned hearing of an application to approve a proposal for the payment of a composition of 7s. 6d. in the pound in satisfaction of the claims of creditors took place on Tuesday before Mr. Registrar Hope. The debtor, Richard Banner Oakley, was described as of Queen Victoria-street, ventilating engineer and financial agent, and Mr. H. E. Burgess, who attended as Assistant Receiver, reported that he was still undischarged in respect of three previous bankruptcies in 1874, 1876, and 1888. He submitted, therefore, that no proposal should be accepted which provided for the payment of less than 20s. in the pound.

The liabilities were now returned at £341 7s. 1d., and the debtor had not deposited the funds required for payment of the composition, although he had been allowed further time for the purpose. The debtor asked for further time to enable him to carry out the proposal. Mr. Registrar Hope declined, having regard to the facts reported, to allow the matter again to stand over, and dismissed the application.

IN RE JOHN HOWARD.—This was a sitting for the public examination of John Howard, of 432 and 433, Kingsland-road, builders' merchant, trading as John Howard and Co. The debtor filed his own petition, and subsequently supplied a statement of his affairs showing gross liabilities amounting to £18,961 5s. 8d., of which £11,749 3s. 3d. was expected to rank, and assets estimated to produce £5,655 0s. 11d. In reply to Mr. H. E. Burgess, Assistant Official Receiver, the debtor stated that in December, 1883, he made a private arrangement with his creditors, under which he paid a composition of 5s. in the pound on liabilities amounting to £1,000. His present insolvency was largely brought about by bad debts incurred in his business. During the past four years he had incurred bad debts amounting to £2,800. Other causes of his insolvency were the insufficiency of his capital for the business, and interest on borrowed money. Upon the application of Mr. Eoever, solicitor, appearing for the trustee, the matter was adjourned to Oct. 14 for further investigation.

A STATUTE OF LIMITATIONS UNDER THE BUILDING ACT.—At the South-Western Police-court on Friday Mr. John Alexander Floate, residing at Tremadoc-road, Clapham, answered to a summons to show cause why he should not be required to remove a wooden addition to the rear of his house, the same having been erected in contravention of the Building Act. Mr. Nicholls appeared for Mr. William Grellier, the district surveyor, by whom the proceedings were instituted. The addition was built many years ago, and it was argued for the defendant that, as the Building Act of 1855 has since been repealed, the court had no jurisdiction. Mr. Nicholls urged that the irregularities committed under the early Act were not brushed aside by the later Act of 1894. The Magistrate pointed out that the Act required that proceedings should be taken within a period of six months. Mr. Nicholls: But the addition was not discovered until May last, and a notice was then served on the defendant. The Magistrate: Do you contend that a district surveyor could come to the court and obtain an order for the demolition of a building erected, perhaps, thirty or forty years ago because of some irregularity? Mr. Nicholls answered in the affirmative, and maintained the six months' period counted from the date of the notice. The Magistrate thought the district surveyor should have found out the irregularity before. He dismissed the summons, with £2 2s. costs.

A BLUNDELL SANDS ARBITRATION.—Mr. R. Clutton, sole arbitrator in the inquiry which was held recently at the Surveyors' Institution ("Blundell and the Secretary of State for War") has issued his award. The proceedings had reference to 40 acres of sandhills near Blundell Sands Station on the Lancashire and Yorkshire Railway, a few miles from Liverpool, and also to 700 or 800 acres of foreshore sand lying in front of them. The claim approximated to £55,000, and was brought by Colonel Blundell to determine what amount should be paid to him by the War Office for the compulsory acquisition of the property for the defence of the Mersey. The land has been acquired for the purposes of a fort for gun-firing practice, and it was contended on behalf of the claimant that a fort put into the middle of the estate must be a considerable detriment to the property for various reasons. The expert witnesses called on behalf of the claimant generally agreed that the total value of the property and the damage was upwards of £18,000, while those called for the War Office put the total at about £17,642. The arbitrator's award amounts to £17,642.

A LONG ACRE ARBITRATION.—Mr. John Troutbeck, sitting in the Westminster High Bailiff's Court, with a special jury, had before him last week, the case of Jacobs v. the Great Northern, Piccadilly, and Brompton Railway Company. This was a printseller's claim for compensation for the compulsory acquisition of the premises, 43, Long Acre, required by the promoters for the purposes of their new Covent-garden station. The claimant holds the premises on a lease at £125 per annum, and, according to his case, the premises had a profit rental of £155 a year, in respect to which he claimed £1,261, including 10 per cent. for forced sale. Other items were, £100 for fixtures, and five years' purchase of the trade profits at £500 per annum. He also asked for compensation for depreciation of his stock. After the jury had viewed the property, counsel agreed to a verdict for £3,000. By direction of the High Bailiff, the jury returned a verdict accordingly.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £7,775, and for the corresponding week of last year £9,045.

Our Office Table.

DISCOVERIES of great interest are reported from Brough, near Bradwell and Hope, where formerly stood a Roman town and military station, and where excavations have been made during the last fortnight by Mr. John Garstang on behalf of the Derbyshire Archaeological Association. On Saturday afternoon the members of the Derbyshire Society visited the spot, the company including visitors from Sheffield, Nottingham, and Manchester. Mr. Garstang gave an account of the work, showing that the walls had been traced round an area of about three acres. One corner was rounded off close to the River Noe, and at the other corner there was a tower, the foundations of which had been bared. This was a Roman fortress of the type that was built in the 1st and 2nd centuries. Indications of three gateways had been found, but there would, of course, be four. The Roman causeway had been found to lead across the top of the inclosure complete, and two posts had been found on which swung the doors of the fort. There were also the foundations of the guard chamber. In the centre of the fortress was a very large rectangular stone building, most probably the praetorium. The entire field was covered with stone buildings—in fact, it was one of the most important discoveries yet made. In some old Roman forts the buildings outside the praetorium were of wood, being only of a temporary character, but here all the buildings were of stone. Two Roman altars had been found, the inscriptions on which have yet to be deciphered. A special feature of interest consisted in portions of a large tablet 5ft. in length; the inscription, occupying six rows of large letters, shows that it was set up when Antoninus Pius was Emperor by a Prefect of the First Cohort of Aquitanians, under Julius Verus, then Governor of Britain. Mr. Garstang pointed out that the whole area was drained by a regular water system of stone drains, which were still perfect.

The excavation of Roman remains at Caerwent, near Newport, Mon, is being successfully carried out by a committee, of which Mr. A. T. Martin, of the College, Bath, is the secretary. Among the features recently brought to light are some Roman houses near the schools, with a later house overlaying one of them. It is impossible to fix the date of the later house, but it is not Roman. It includes a small subterranean chamber, or cellar, built largely of Roman materials. The line of pipes which was traced near the north gate was again discovered in this field, with the addition of a small concrete culvert, and some portions of streets have been discovered. The present is the fourth year of the exploration committee's work, and it promises to produce results even more important than those of last year.

The Garden City Pioneer Co., Ltd., has acquired about 4,000 acres of land near Hitchin on which to build the first garden city. The estate is about 34 miles from London, and the nearest point is a little over a mile from Hitchin Junction, on the Great Northern Railway, the latter being reached in 42 minutes from King's Cross. A company will shortly be formed to carry out the scheme. A cumulative dividend limited to 5 per cent. per annum will be paid to the shareholders, and the balance of profit will be used for the benefit of the town and its inhabitants. Information regarding the scheme can be obtained from the secretary of the company, Mr. Thomas Adams, 347-351, Birkbeck Bank Chambers, Holborn.

On Saturday the London lodges of the Operative Bricklayers' Union visited Chatham, where they celebrated "Bricklayers' Day" by joining with the Chatham and Rochester Branch of the union in a great demonstration with band and banners through the main streets, concluding with a mass meeting in the Rochester Recreation Grounds. The local speakers included Messrs. R. Powell and A. W. Ireland, of the Rochester Corporation; W. J. Lewington, of the Gillingham District Council; and E. P. Wake, president of the Medway District Trades Council. Mr. H. Rolfe was chairman. The London leaders included the general secretary of the society, Mr. J. Batchelor; Mr. H. R. Taylor, London County Councillor; Councillor Condon, of Hackney; and Mr. A. Lake, a veteran trades-unionist. The burden of the speeches was "no connection with either of the orthodox political parties, but direct labour representation in county, municipal, and district councils, and in Parliament."

THE annual report on the museums, colleges, and institutions under the administration of the Board of Education includes the Victoria and Albert Museum; Royal College of Science, London; Royal College of Art, London; and the Geological Survey of the United Kingdom and Museum of Practical Geology. The most striking feature brought out in that portion of the report which relates to the Victoria and Albert Museum is the steady decrease in the numbers of the public availing themselves of the institution. The figures of attendance in all cases are given for the period of 1898-1902 inclusive. In the reading-room returns of the Art Library, which embrace attendances of readers, work consulted, and permission for use of water-colours, there has been a general decline as compared with the years 1898, 1899, and 1900, but an advance as compared with 1901, in which year the figures in each class touched low-water mark. There is also a marked and steady decrease recorded in the figures relating to the Science Museum and Library, and that in no year was the decrease stayed. Students in Department Schools have fallen from 9,695 to 6,425, and consultants of patent specifications and school teachers also show a decline. The same evidence of dwindling public interest is found in the return of the number of visitors to the Western Galleries (Collections for Scientific Instruction and Research). At Bethnal Green Museum the number of visitors during last year was 407,999, a decrease of 81,053 as compared with 1901. Of the Royal College of Art the report says: "It is gratifying to find that in every branch of the work done in this college good progress is reported, and there are not wanting proofs that the present curriculum of the college is well calculated to carry out the object for which the college was founded—namely, the training of art teachers and craftsmen who will one day take part in leading the taste of the country in matters of art. The craft classes adapted for designers are beneficially affecting the students."

UNDER the auspices of the Sanitary Institute, the 36th course of lectures and demonstrations for sanitary officers will be given during the next two months, beginning on Monday, the 14th inst. The course includes the following lectures:—In Part I., four on elementary physics and chemistry in relation to water, soil, air and ventilation, and meteorology, and twenty-one on public health statutes, the practical duties of a sanitary inspector, municipal hygiene or hygiene of communities, and building construction in its sanitary relations, local physical conditions; measurement and drawing plans to scale. Inspections and demonstrations are arranged in connection with the lectures, and include visits to disinfecting stations, dairy premises, municipal depots, artisans' dwellings, offensive trades, water-works, common lodging-houses, sanitary works in progress, refuse and sewage disposal works. In Part II., seven lectures will be on meat and food inspection. The lectures at the Parkes Museum, Margaret-street, W., will end on Wednesday, November 25.

A CONSULAR report reveals the fact that the "mother-of-pearl" so familiar as an inlay in all sorts of furniture and woodwork from Damascus is not real "mother-of-pearl" at all. It is obtained from a common fresh-water bivalve found in large quantities at Deir-el-Zor and other places on the banks of the Euphrates, and not from the Red Sea oyster, as is commonly supposed. If the latter were employed, the cost of the various articles which it serves to adorn would be far greater than it is, the price of the common shell being about 1d. per pound, whereas the genuine article costs from 1s. to 1s. 7d. per pound. "However," says the British Consul at Damascus, "it can hardly be maintained that any deception is practised, because the eye, even of the amateur, can distinguish at once the difference between the two, the exquisite iridescent sheen, delicacy of colouring, and general brilliancy of the one being entirely absent in the other."

THE Vacation Judge, Mr. Justice Walton, on Wednesday, authorised the expenditure of about £3,000 from the Sebright capital on the old Hertfordshire mansion, "Beechwood," belonging to Sir Edgar Sebright. Incidentally, Mr. Bramwell Davis, K.C., showed that the dilapidated condition of the house reflected the wanderings of an ancient family. The present baronet's nephew and predecessor had never lived there, while that man's predecessor had been mixed up in gaming and money-lending transactions still

referred to with hushed voices in the country-side. One alteration is to be a separate entrance to the beer-cellar. At present the only way into it is through the strong-room—perhaps an instance of the suspicious nature of old-time occupants or their architects.

A PARLIAMENTARY RETURN has just been issued showing the amount spent on technical education by local authorities in England and Wales during the year 1901-2. Particulars are also given of the amounts raised by loan on the security of the local rate under the Technical Instruction Act, 1889—mainly for the erection of science, art, and technical schools—of the amount of loans so raised outstanding on March 31, 1902, and of the balance in hand of moneys received and allocated to technical education. The Return shows that the total amount thus expended on technical education in England and Wales during the year 1901-2 was £1,057,399 0s. 2d. This amount is exclusive of the sums allocated to intermediate and technical education under the Welsh Intermediate Education Act, 1889. The amount raised by loan on the security of the local rate under the Technical Instruction Act was £206,426 4s. 7d., the amount of loans so raised outstanding was £1,030,952 12s. 5d., and the balance in hand of moneys received and allocated to technical instruction was £658,319 16s. The total amount of the residue received under the Local Taxation (Customs and Excise) Act, by the councils of counties and country boroughs in England (excepting the county of Monmouth), in respect of the financial year 1901-2 was £855,257 14s. 5d., of which £817,969 15s. 7d. was appropriated to educational purposes, and £37,287 18s. 10d. to relief of rates. Of the 49 county councils 41 are applying the whole of the residue to technical education, and 8 a part of it to the same purpose. Of the councils of the 64 county boroughs, 59 are devoting the whole, and 5 a part of the residue to technical education. Further, 3 county councils and the councils of 30 county boroughs, 99 boroughs, and 189 urban districts, in England, are making grants out of the rates under the Technical Instruction Acts; and 25 local authorities are devoting funds to technical education out of the rate levied under the Public Libraries and Museums Acts. The total amount expended on technical education during the year was £1,068,917 11s. 3d. The total amount of the residue paid to the 13 county councils and the councils of the 3 county boroughs in Wales and Monmouth was £41,042 4s. 1d. These local authorities are devoting the whole of it to intermediate and technical education. The total amount expended on technical education in Wales under the Technical Instruction Acts during the year was £48,451 5s. 11d.

MESSRS. WM. AUGS. GIBSON, LTD., of Temple Bar House, Fleet-street, the well-known makers of electric, hydraulic, and hand-power lifts, have our sincere thanks for a most useful envelope-opener they have sent us. The average envelope-opener is a delusion and a snare; but this handy little tool is the embodiment of despatch, and lifts loads of works from the fingers of people with a big letter pile on their desks, with the celerity and certainty of the other lifts for which the donors are famous, and of which every reader who gets one of these admirable labour-savers will be pleasantly reminded every time he uses it.

STATUES, MEMORIALS, &c.

WANTAGE.—The dedication of the memorial cross erected by Lady Wantage to the memory of her husband, Lord Wantage, V.C., K.C.B., took place at Lockinge Down, Wantage, on Saturday afternoon. The monument is erected on the highest point of the down, upon an ancient burrow, and will form a conspicuous landmark. The base is an octagon pedestal of Portland stone, bearing an inscription, and from it rises a tall marble pillar supporting a short red marble shaft culminating in a carved white marble cross. The height of the monument is 33ft. 6in., and the column and cross are exact copies of the San Zenobio at Florence, and were carved in Italy.

A destructive fire occurred on Sunday at the premises of Messrs. R. May and Sons, timber merchants, in Frensham-street, Peckham. Three large stacks of timber, each about 40ft. long and 40ft. wide and standing about 20ft. high, were first destroyed, and the flames then involved a building measuring 45ft. by 15ft., used as a boiler-house. The fire is attributed to the overheating of the boiler.

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CLIENTS AND THEIR REQUIREMENTS.

A GREAT deal of the work done by the profession is of a discursive character. It refers to interviews with clients about site, the plan and design of the intended building, about cost, legal business negotiations, and a variety of other matters of an informal kind. In these interviews the education, culture, and experience of the professional adviser are called into exercise. They depend upon what he has seen and read, rather than upon his actual acquirements as an architect. As a rule the average practitioner is not a widely read man; he may have good business qualifications and practical knowledge of building, but his acquaintance with subjects outside his own vocation is often not equal to that of a client who has moved in a different sphere of life to his own, who has travelled much, and has a general acquaintance with men and letters. A client of this sort may come to him with a keen sense of the requirements of a gentleman's residence, and even a knowledge of architecture that may embarrass him, of a type of plan or a mode of decoration about which he knows very little; and it is expecting too much to find his requirements or hopes realised in the design. No doubt such a case is a rare one, but it occasionally happens. The client's ideas are distinctly of a more advanced order than his architect is accustomed to satisfy. The client is disappointed at the result, and may even think he could have designed a better house himself if he could only have put his ideas into the shape of plans and elevations. But it is so hard to bring one's preconceived views to the test of the standard required. There are plenty of business men, too, who have a better sense of what they want than the architect can give them. They know the details of their business or trade better, but they have not the means of putting their wants into a practical shape. These are the men whom the architect is often confronted with; individuals with clear ideas of their wants, but unequal to the task of putting them into form. In short, the function of interpreting another's wants and tastes is one of the most difficult. The only way in which it can be learned is to place oneself as nearly as possible in the position of the client, to try to see as he sees, to enter into his business habits and tastes, to try to realise his surroundings and mode of life, which can only be done by a study of the details of his business and character. If the architect could spend a few days or weeks with his client observing closely his talents and tastes or his business requirements, a better idea could be gained than a short interview affords. But such a thing is impossible. Instruction by word of mouth or writing is the only way that is available, and, of course, a great deal is taken for granted on both sides, which may mean a considerable divergence from the intentions of the client. Thus the latter's instruction about requirements is assumed by the architect to be in accordance with ordinary types, whereas the client intended something widely different. Where the latter understands plans, the architect's duty is simple. He can submit sketches of one or two types of house and find out exactly what the client desires. The gentleman who is fond of sport will require a very different kind of house to a country gentleman who entertains largely or has a hobby of one kind or another. A great difference arises in

habits and tastes which no perfunctory verbal instruction would reveal; but the architect is presumed to know, and this presumption on the client's part constitutes one of the troubles the professional man has to diagnose. Of course, these difficulties are greater in the case of a man whose education and tastes are much inferior to those of his patron. He cannot enter so keenly into his client's tastes, his sympathies are widely different, and it is impossible for him to see, eye for eye, as his client does. The consequence is, the design is not a success—there is a note of discord apparent.

If we consider the other and larger class of clients which the profession have to treat with—the uneducated man whose wants and tastes are on a much lower level, and who has to be instructed up to the standard of respectable society, the case is different. The architect must lower his standard, as he cannot always manage to raise that of his client. It must be a compromise. This sort of client has been brought up with strange and prejudiced ideas of all architectural matters; he does not know anything about plan, which is an enigma to him; nor can he express himself intelligibly as to his requirements. In a majority of cases he does not know what he wants; the professional adviser has to diagnose and find out the requirements and tastes of his client, and the tact and method of ascertaining these are not the gifts of everyone. Consultation is one of the means open to the architect: it must be a free rather than a formal act of deliberation—a meeting to take counsel together to elicit from the client the real wishes he has in view. Having ascertained these, the adviser is better able to make a decision as to the kind of plan and design that will be suitable. But with clients of this kind there is often a dictatorial attitude assumed on the part of the professional man, who puts before his employer a design in a sort of "There, that-is-the-plan-that-you-want" way. No doubt there is much to disgust the sensitive architect; this kind of client is always thinking that as he pays he ought to have what he likes, that the architect has only to submit drawings or pictures that will satisfy his views and taste. To take a few instances. There is the inevitable builder-client who regards himself as an authority on house-building, but who simply desires his own ideas drawn out. Of course, he does not wish to pay the professional commission, and wants to make an agreement with the architect. If this is consented to, and plans are prepared, the chief difficulty experienced is to bring one's matured conception of design down to the level of a man who is an amateur in building—who desires a square house of box-like type, a double-fronted villa with a centre entrance between two rooms. The architect has to use his arts of persuasion to overcome this prejudice—one of the most inveterate to deal with. Then there is the "practical client," who desires to have everything settled and square; to know the cost, and who undertakes to buy all the materials himself, and to look after the work if the architect will prepare the plans. He is strong on ventilation, the economy of a good square-built house, and on certain hobbies of his own. Or there is the client who wants a house built to fit his furniture, his large dining-room table and sideboard, and other special pieces of old furniture, his pictures, &c. The wife wants her carpets and curtains to be made the controlling feature; the rooms must be of certain size and height. A "handsome carved sideboard" of large dimensions must be provided for at all costs, though its size may add considerably to the cost of the house.

These are typical clients of the modern architect. Each of these has to be studied as a specimen of the *genus homo*. Each will have a standard of his own, which the architect will do wisely to study, not with the

view of conceding to all the whims, but of endeavouring to talk the matter over in a business point of view, and of showing the client the mistake or error of certain things he entertains, such as the plate-glass window craze or the centre front entrance. The requirements of plan alone afford the occasion of many homilies and dissertations on taste and good planning. The client with a fancy for a central hall and costly staircase right in front of the main entrance has to be reasoned with in a conciliatory way before he is inclined to give up his fad. The love of ostentatious display and living is one of the commonest weaknesses of the successful tradesman and British Philistine, and once the client can be brought to realise that the arrangement he wishes is not in good taste or adapted by people of a superior class, he may be inclined to listen, if not willing to give up his idea. Fashions and popular notions die hard, and if the architect cannot persuade his employer to abandon a particular fad, he will be doing his duty in dissuading him and advising him to adopt another plan less open to objection. In the planning of country and detached houses, it is still hard to convince such people of the mistake of certain arrangements that are popular; of the lack of privacy in doors to principal rooms opening near the entrance, or of a staircase ascending straight before the front door. But there are people who like to see and to be seen, and for them, the centre entrance which enables all visitors to peer through the windows on either side, and those inside to scan those who are approaching the house, is a coveted one. The architect would be giving away his profession and reputation if he did not argue with his client on the undesirability of these and other arrangements. To easily yield to the prejudice is to forsake his position as a professional adviser, and lay himself open to disparaging remarks by those who happen to visit the house, and who have sounder views of building, including the client himself, whose tastes may in the course of time undergo a change. The aspect and outlook of windows is another point which is often seriously misjudged by those who build. In this case, of course, little choice remains for buildings in towns; but when the site is open there ought not to be any doubt. An employer has a preference for his principal rooms to face in a certain direction or towards a road, quite regardless of the proper aspect for the room or its real comfort in summer or winter. The architect ought to be, in such a question, an authority, as it is so vital to the comfort and health of the inmates. He should make it clear that the best aspect for principal rooms is the south-east or south in our hemisphere; that windows should look eastward for morning sunshine; for midday sunshine, south; for evening, westward; and for coolness, eastward, the best compromise being south-east. That between south and south-east the aspect is genial, and between that and north-east, dry; while the rough winds are found in positions from south to west, and the stormy aspects between north and south-west. There is an ample choice for plans which are not restricted as to site. His authority on these points ought to be quite as much uninfluenced by lay ideas and fancy—as that of a medical practitioner or lawyer, whose opinions the public accept without question. The professional man must be prepared also to meet the client who wishes that his house should be like that of another built under very different conditions on a site quite reversed—a very common experience in dealing with those who think a plan can be planted everywhere; that the front of a residence, for instance, facing south-east in the plan prepared can be made to face west or south-west equally well. Strong arguments against such a misappropriation ought to be availing. There should be no uncertain note in the attitude

of the adviser on such a fundamental point; nor should a client be able to dictate any opinion on the position of any window, door, or fireplace in any room which is contrary to judicious planning or design. We are afraid the employer is too often able to control his advisers on these points. They are details which appear to the uninitiated of small importance, though in reality the convenience and comfort of a house depend very much on them. Here also there are established principles which cannot be departed from without detriment. There are certain undesirable positions for doors, fireplaces, and windows. Thus a fireplace next to or on the same side of the room as the door, a door just opposite a fireplace, or on the return side near the fireplace wall are all bad. Again, the proportions of rooms, their height and lighting, size of windows are questions that the architect should control. Unfortunately, it happens sometimes that the client has a better sense of these things than his adviser, who has been trained on precedents, and has little scientific knowledge. We pity such an architect. We see such things as a small window of squarish proportions lighting a room of considerable size placed at one end or in the centre of a long wall; or a too-large window lighting a small room, and requiring to be curtained off on certain months of the year; very lofty small rooms or low large ones, windows at one corner leaving dark stretches of wall—all grievous mistakes, in a house or block of offices where light and ventilation are of vital consequence. Where planning is conducted without a knowledge of science or common sense, the enemies of the profession can revile, and the architect has a poor chance of enforcing his authority. In his work on "Rural Hygiene," Dr. Poore makes a few remarks that are worth quoting. He says: "Architects are educated for the most part in crowded centres, where the problem of how to get the greatest amount of accommodation on the smallest area is paramount, and it too often happens that the town-bred architect, when called upon to build a house in the country, is unable to cast away the unwholesome notions which have been engraved upon him in the city, and oftens fails sufficiently to appreciate that the building of a country residence is a problem quite distinct from the building of a town residence, and that nothing is so conducive to the comfort, beauty, and wholesomeness of a dwelling as is an ample area upon which to construct it." This observation is only too fully borne out by many who have examined the two classes of building. The town-bred and trained architect is often quite incompetent to design a country residence with any degree of freedom. The restraints of town building compel him to use all his resources in meeting the demands of municipal building regulations, and in adopting a type plan that is only suited to cramped sites, and his country residence bears the same marks of restraint and crampedness in its appointments. The reception-rooms are often not so large as they might be; the hall and stairs looked cramped, and the domestic offices are planned in a wing of inadequate size and accommodation; in short, the two sorts of design are very different, and cannot be well studied by the same individual. The training in town building has its decided advantages: it compels attention to economy and compactness of plan not so much needed in the country. Country life and town life are in many respects at variance: the habits and tastes of the two kinds of tenant are different. One requires ample space to move about; his rural tastes and sports have to be satisfied with accommodation of a much more liberal kind in the offices. The other lives a town and conventional life, and he confines himself to a few rooms, though these may require more decoration and finish than need be bestowed in the rooms of a country house. But one of the

main differences in the planning of a country house is in relation to the kitchen and offices. These may form an annexe even detached from the main part of house, where the cisterns, sinks, baths, closets, &c., should be located, and can be connected on both floors by cross-ventilated lobbies, if necessary. In this way the designer may isolate all sanitary offices from his building if he likes, though this is less necessary in the country than the town. There is no excuse, however, to be made for three-story residences where there is plenty of area, with nurseries on the top floor, and sinks and closets very near the bedrooms. Sanitary arrangements need not be carried to an extreme in a country residence, where there is plenty of air and space all round. The old types of hall and manor-house furnish the architect with good models; where the offices are placed round, or partially round, a court or kitchen garden, and the reception rooms grouped round the hall and opening out of it. In the smaller country house the hall or living-room ought to be the keynote of the house. Round this hall, which should be central, can be grouped the other rooms, the children's room, "den" and "bower," with an annexe for the kitchen offices. While clients' wishes and tastes will differ widely, and must be respected in their special requirements, the architect must not swerve from his duty in pointing out essentials and those fundamental principles we have noticed. His motto should be: "In things essential unity, in non-essentials liberty." The client comes to the professional man for advice and experience in his special sphere, and it is unworthy of the trust reposed in him if the latter yields unwittingly to the whims of his employer.

In the realm of taste, very few clients would deny their ability to decide on questions of style or decoration, although as a matter of fact there is no other branch in which they commit greater mistakes. The successful tradesman who builds a house in a fashionable suburb believes, of course, that "Queen Anne," or some modern craze of house building, is the right one to adopt, and he orders his architect to design his residence in that style; but he knows nothing about the matter, and would as soon blame his adviser probably for not giving him a design he liked better in some bizarre or showy style: so inconsistent are people who have no real taste for art. Then we have heard of people who have a pretence for art desiring a "Queen Anne" house, but who at the same time wish their architect to give them bay windows of plate glass in large panes, so that the lady's lace curtains may be displayed to advantage. These and other anomalies are common amongst clients who wish to dictate in art. We know in such matters as the selection of wall-papers and ceiling decoration how the most grievous mistakes are made. Rooms with a north aspect are covered with papers of dark and sombre hues, instead of with bright and cheerful tints, and rooms facing south having abundance of sunlight made unendurable by wall-papers of strong or warm colours. Nor is the height, purpose, and size of rooms considered in the pattern when we see such things as lofty rooms covered with papers in which vertical stripes or panels abound, where a pattern of horizontal features would be more tolerable; and a dining-room having a bold-patterned wall-hanging over which pictures are hung, instead of being of subdued tone, without any decided pattern or colour. These may appear small matters to the client, but they are just those indications of taste which are at once convincing to the man or woman who has the slightest knowledge or feeling for art. Tastes vary in degree. Thus, the wallpapers or decoration that would be the right thing in a refined West End locality would not be tolerated at the East End of London. Bright colours and decided patterns which would be admired in

a country cottage in the North would be thought vulgar in Regent-street; but though they vary, the same principles predominate, and prove the direction of true art.

STRUCTURAL DETAILS AND FITTINGS.

WHILE every branch of building has been written, discussed, and talked about, there has been a dearth of works on those structural details and fittings which form so important a part of every building of any pretensions. A building without fittings and furniture loses much of its purpose, beauty, and impressiveness. Even a room denuded of its furniture has a vacancy and meaninglessness about it; but in the furnished room we can appreciate the scale and intention of the architecture; we have evidence of human occupancy and the soul of the tenant. The furniture is the complement to the architecture; one cannot be complete without the other. Structural details comprise so large a part of the art that it would be impossible in a short article to discuss the subject in an adequate manner befitting its importance. Such details would include doors, windows, fireplaces, skirtings, dadoes, cornices, and a variety of other matters; but except in their relation to architectural style, we have very little information about them. There are very few rules about the proper size of doors and window openings for certain rooms, or the principles of design applicable to such details as skirtings or cornices, fireplaces, overmantels, and over-doors, though numerous designs are published, and their construction and measurement for quantities are to be found in numerous books. Even the important subject of staircases has been treated more in its connection with the architectural style of the building, or as a piece of joinery, than in a scientific manner relating to the actual requirements of the building. The reason of adopting a certain plan of stairs, their proper material, the relation of riser to tread, or the rules to regulate the "going" to the rise of stairs, are not discussed in the manner that the young student would like them to be. Their usual construction only is treated, and the technical terms defined; but the beginner in construction has to use his own unaided skill in determining many of the more important points. There are plenty of admirable precedents, but no instructions as to the principles of design. Floors and roofs have been more exhaustively treated, theoretically and practically; patented systems of construction have been described and illustrated; but to such questions as, which is the best floor for a certain building or room, or the best roof for a given span or shape of area, and for certain purposes, or how should it be constructed, and with what scantlings? answers are not easily found. The architect, in fact, has to evolve them out of his own mind. He must consider the problem he has to deal with—whether the building is for domestic or public use, the actual loads required to be provided for, the material at disposal. But this is not the way the average architect goes to work. He tries to find out a floor or roof that will suit him. He can do so by looking over the volumes of the BUILDING NEWS or a catalogue of floors and roofs, and he finally, by an effort of imagination, adapts, as well as he is able to, one of these types to his requirements. It may be a rather rough approximation to what he desires, and that is all, for he cannot at once hit upon an example that is exactly suitable—the conditions vary. So it is with every design made without first, a clear knowledge of what is wanted, and secondly, a method of working it out. These are the two things which the architect is often not certain about in his own mind—he may know one and nothing else. If he knows exactly what he wants

say it is a design for a roof over a given area, he is at a loss to find out how to make the necessary details, to draw out the members to their proper dimensions or scutlings from a proper calculation of the strains. To take as an example a floor: a certain safe load has to be allowed for, and it is necessary to find out the size of girder which has to carry perhaps half the load. The process is an easy one when understood; but the detail for girder cannot be made until the depth and breadth of girder is found by calculation. Probably the size of girder has been determined beforehand, but this must be verified, and its depth and width increased or additional columns placed below it.

The fixtures and fittings of buildings are no less necessary details to determine before the plans and working drawings of certain buildings can be made. We take here, by way of example, the desks and seats for schools required by the Board of Education. Before the accommodation of a school can be ascertained, the area per child or minimum floor-space has to be found, which is 10sq.ft. A school for older scholars can be planned only after we know how many of them can be seated at desks arranged in accordance with certain rules. These give 18in. per scholar at each desk and seat, and the length of each group of seats must therefore be some multiple of 18in., allowing 18in. for gangways between the groups and walls. Dual desks are about 3ft. 4in. in length, with gangways of 1ft. 4in., and for groups of desks a length of 12ft. is the maximum. These dimensions form the basis of any design. Rooms for cookery and manual instruction have to be laid down on plan, upon the units of certain fittings, tables, sinks, raised platforms, and desks. For cookery the floor space allowed is about 20sq.ft. per scholar. In laundry work a gallery or platform is necessary, with desks for 42 children; and the laundry tables have to be made to allow 3ft. of space for each scholar. In the manual instruction rooms the workshop model must be followed, and for science rooms, tables, sinks, cupboards, and shelves have to be provided for in the plan. An area of 600sq.ft. of floor space is considered sufficient, and for laundries and cooking-rooms about 750ft. In elementary science schools, where chemistry, physics, and mathematics are taught, the fittings and apparatus are necessarily simple, consisting of black boards against the wall, balance shelves for exercises with weights and pulleys, a table, and about three benches. But the architect ought to be able to fix their positions on the plan. The table and benches may be placed parallel to each other, the space between each not less than 2ft. 9in., so that the teacher may reach every pupil; the space allotted to each pair of children facing the teacher would be about 2ft. 6in. or 3ft. These benches are about 2ft. 4in. wide and 2ft. 8in. high. The sinks can be placed either against the walls or the ends of one bench. For ordinary classrooms, benches (says Mr. J. Lomas, A.R.C.S.) may be fixed along the walls. These consist of cupboards containing shelves projecting 5in. or 9in. into the room. The doors are hinged at the bottom, and when open form a working bench, and are supported on folding brackets. A gaspipe with nozzles for tubing at each working-place afford the gas supply, and water can be laid on at the corners of room. When the benches are closed, the whole form a series of cupboards round the room about 4ft. 3in. high. Sometimes one room serves as both a chemical and physical laboratory; but separate rooms are desirable for delicate physical instruments. For chemical laboratories, draught closets must be fixed, say, between the windows of a room, so that the extract flues may be carried up through the walls. These closets are about 2ft. 6in. wide by 1ft. 7in. deep, but larger ones 4ft. wide and 2ft. deep are often

required. The front of closet is closed by a glazed sash counter-weighted, and details of these may be seen in all chemical laboratories. The top is also sloped or hipped back, and also glazed like the front and sides of closet. Evaporation closets are often used in quantitative work, and these are described by Dr. Thorpe, and are made specially. They form a kind of lavatory arrangement, with copper pans or inverted cones, in slabs of stone or slate. The closets are each about 19in. square; there are lifting glazed sashes with glass partitions between each pair of closets.

Physical laboratories require good light and ventilation, and steady working benches. As vibration of any sort is objectionable, the physical laboratory should be placed on the basement or ground floor. For a laboratory for elementary work, a floor area of 30sq.ft. for each student, including gangways, &c., is thought sufficient. Benches may be wide, for students to work on both sides, or narrow, to be placed against the walls. The former may be 4ft., the latter about 2ft. 6in. For each worker the length of table top may be from 2ft. 8in. to 4ft.; but this depends on the kind of work done. Details and benches for physical work are given in Mr. T. H. Russell's useful work on the "Planning and Fitting-up of Laboratories" we lately noticed. A wall-bench consists of cupboards, with shelf, drawers, and leaves just below the bench-top, and above a rail supported on brackets from the wall. The lower arrangement of cupboards and drawers, about 3ft. high from floor, resembles a dresser. The bench top has sinks at intervals for the use of each pair of pupils, gas and water. The top of bench should be made of teak, which resists acids and withstands heat. Water taps and gas are laid on at intervals. These and other details may be found in any technical school, and are given in Mr. Russell's work. Our remarks here are intended to refer to plan rather than to the details of fittings. A laboratory must be planned with reference to the position and space occupied by each fitting. These, as we have said, consist of tables or benches of certain size placed in the centre of room, with sufficient space round each for students, or benches against the wall, a cupboard, a sink or sinks, and blackboard. The tables or benches may be square or oblong, but with the space for each worker. They can be arranged differently to meet the shape of room, but it is necessary to determine the most desirable arrangement before the actual dimensions of the room are fixed. We should advise for this purpose a number of pieces of thick drawing-paper or card cut to the dimensions by scale of the benches, sinks, cupboards &c. These should be arranged on paper, with the necessary gangway space, &c., between them, and the actual dimensions of room can be determined in this manner more conveniently than in drawing them on the plan at random, and then erasing them till a satisfactory arrangement is made. Next to the laboratory there should be a professors' room, with tables and benches; in connection with it a preparation room for apparatus and instruments, communicating by a door with the lecture room, near the lecture table, and a lecture theatre adjoining, with sloping seats. In fact, the laboratory, or laboratories if there are two, the professors' room, preparation-room, and lecture theatre should all be intercommunicable by doors, and also be entered separately from an outer corridor, which may be formed round an open area. A second small lecture room, an optical laboratory, and apparatus room are necessary in a well-equipped college. Such an arrangement of laboratories and lecture rooms may form a square round an open area. At the Manchester Municipal School of Technology, the laboratories and lecture-room form a long range on one side of corridors. On one floor

is an advanced physical laboratory, about 50ft. long by 26ft. wide, lighted on one side. This contains tables, piers, and three long benches down the centre of room, with the usual sinks and benches, &c., along the wall. At one end is a small preparation-room, and at the other end a professors' room communicating with a special laboratory, about 30ft. by 18ft. On the floor above is an elementary physical laboratory, and a lecture room, &c., over the advanced physical laboratory. The whole buildings form a double quadrangle, the open areas being divided by a large laboratory having fourteen benches in two rows, and lighted on both sides; the other rooms are ranged round the outer corridors. For a physical laboratory, plenty of blank wall is necessary for the experimental demonstration of the parallelogram of force theorem, and other manipulations, in which cords and pulleys, and weights, &c., are required. We have spoken at some length on laboratory arrangements and fitting, as they have so important a bearing on technical school architecture. These fittings, in short, become the root or germ of technical school planning, and if we are to have a development arising out of the requirements of technological school building, we must begin by a careful study of the necessary furniture of these buildings. It is for the architect in each case to render these fittings as presentable and pleasing to the eye as their utilitarian nature permits. At present it must be confessed that the architect leaves too much in the hands of the technical fitter, the manufacturer of furniture, and individual taste.

A GLASGOW COLD STORAGE.

MANY correspondents who have written us from time to time lately in search of information on the construction of cold storage stores will be interested in the following particulars of the recently-completed ice and cold stores for Mr. William Milne in Old Wynd, Glasgow.

The buildings have a frontage to Old Wynd 172ft. long, lying north and south. At the north-west corner a wing or extension has been constructed, running backward to Stockwell-street. The extreme width of the buildings is 193ft., and the area covered about 2,500 square yards. The front is 66ft. high, and, though plain, is imposing by its extent. Four stories are visible, but there is also an extensive basement. The buildings are faced with smooth red bricks. At the front there are two entrance doors with arched and ornamented heads and with red freestone dressings. At a point 100ft. from the north end there is a main entrance for carts and conveyances 13ft. wide; and at a point 3ft. 6in. from the south end there is a second entrance gate for conveyances 9ft. wide. The main cartway broadens to 30ft., and is carried through the building for 100ft., nearly to the outer wall. On entering by this cartway from Old Wynd, a cart or a visitor passes immediately over a Pooley weighing machine, the platform of which is set flush with the roadway to allow carts to be weighed. On the right hand of this cartway lies a loading platform 18ft. wide, and to the right of that again stand the ice-making tanks. On the left-hand side there are offices, which are 60ft. by 20ft., then the compressors and driving engines; and, beyond the engine-room, the boiler house. Engines and boilers will be set 4ft. 6in. below the ground level.

A very strong system of construction has been adopted to insure a carrying capacity of 4cwt. per square foot over the entire floor area of the buildings. The main supports other than the walls are four rows of cast-iron columns 14in. in diameter on the ground-floor, which are placed generally 18ft. from centre to centre, seven columns being in each row, and the rows 18ft. apart. The floors are carried by compound steel girders which rest on the columns, each girder for the first-floor consisting of three 12in. by 6in. girders riveted together.

The ground-floor above the basement is formed of concrete 5in. thick of four-to-one composition. This is carried by steel girders 15in. apart. The basement is divided, one part, used for general

storage, being 60ft. by 30ft. Another part has been finished to serve as the ice store, and is 100ft. long by 80ft. wide. The floor will be formed with a foundation bed of concrete 6in. thick, and will be insulated. An air space of 2in. has been left above the concrete formed by the use of battens, and a layer of 1½in. boards covers the battens. Then come 9in. of McNeill's slag wool. The floor is formed of two layers of 1½in. boards with insulating-paper between. Another portion of the basement adjoining the boiler-house is set apart as a coal-store, and will hold about 300 tons. A tank for cooling brine, used for freezing the water in the ice-making cells, will also be placed in the basement.

Refrigeration is produced by the compression of ammonia, the system and machinery of Messrs. L. Sterne and Co., Ltd., Glasgow, being employed for the purpose. The engine-room is 60ft. by 40ft. by 21ft., and has had a bed of four-to-one concrete, 30ft. by 9ft. by 7ft. thick, carefully prepared to afford a foundation for the massive machines which have been introduced. Engines and compressors together are of the standard type, the steam-engine of each set being horizontal, and the two compressors placed vertically above the crankshaft. There are two sets of engines and compressors. Each steam-engine is of 150H.P., and is compound, with cylinders 16in. and 27in. in diameter, and with stroke of 24in., and will be run at about fifty revolutions. The cylinders are arranged "tandem," a 12in. air-pump being in line with them, and being worked by a tail-rod. Corliss cut-off gear is provided, and, ordinarily, will cut off steam at about one-third of stroke. Each crankshaft has a flywheel 12ft. in diameter, weighing seven tons, made in halves, which are bolted together through hub cheeks with 2½in. bolts. The two sets of machines lie side by side, the flywheels being placed on the end of the shafts in one pit so as to come close together in the centre of the sets. The compressors are double-acting, and each machine has a capacity equal to the production of 100 tons of refrigeration per day. Exhaust steam from the engines and the compressed gas is conducted to the respective condensers, which are situated on the roof of the main building. The roof is entirely flat, and has been constructed of sufficient strength to carry a weight of 300 tons. Both the steam and the ammonia condensers are of the exposed atmospheric type, the steam condenser tubes being arranged vertically and the ammonia tubes horizontally. The latter are 2in. in diam. inside and 3in. in thickness, and have a lineal run of 8,100ft. As far as may be required, water for condensing will be drawn from the town supply; but the water, after use on the condensers, will be used for the boilers.

The boiler-house is 60ft. by 40ft. It contains two Lancashire boilers—21ft. by 7ft. 6in.—the two flues of each boiler tapering from 3ft. to 2ft. 6in. Steam is kept at about 150lb. A Green's economiser with ninety-six tubes is used in the main flue, the scrapers being worked by a small horizontal steam engine. A circular brick-built chimneystack, 130ft. high and 11ft. in diameter inside, rises by the boiler-house outside of the main building. The stack was designed by Mr. William Howat, superintendent engineer to Mr. Milne, to fulfil a twofold purpose—the independent fire-brick being carried up for 80ft. inside the chimney, the 3in. air space being in connection with an open flue between the engine-room and the boiler-house, which are thus ventilated.

For pumping water five centrifugal pumps are used. Two 3½in. pumps supply water for the steam condensers, the water, drawn from the town supply in the first instance, being used again and again, and made up from the town mains as required. Two 3in. pumps will supply water to the ammonia condensers, and one is used to circulate warm brine through the wall cavities of the freezing cells in the ice-tanks. The cold brine is circulated by two No. 5 patent drum-pumps. All pumps are driven by electric motors. Electricity is used for lighting the whole establishment, and is generated by machines stationed in the engine-room.

The area of the ground floor set apart as the ice factor is 100ft. long and 60ft. wide, the height of the room being 17ft. Four rows of wood-framed tanks (four tanks being in each row) have been constructed to hold the cells in which the ice is made. Each set of four tanks contains sixty-six cells, in each of which a block of ice weighing 1cwt. can be produced. A partition, however, has been placed in each cell, by which two blocks,

each weighing about 2cwt., will be obtained from each cell. A side cavity has been left in each tank, and a space below the bottom of each set of cells for agitation, Siddeley's plan of side agitation being adopted. The rods and levers are worked by belt, pulley, and gear-wheel connections. The motion of the water in the side cavities is communicated to the water in the cells through small apertures in the bottoms of the cells. A travelling crane capable of lifting 30cwt. has been provided for each of the four rows of tanks for raising the blocks of ice from the cells. The productive capacity of the ice plant at present installed is seventy tons per day. Space, however, has been left for an addition, which will increase the capacity to that of one hundred tons per day.

The three upper floors of the buildings are fitted up as cold stores. Ten rooms have been constructed on each floor of the main building, giving a total of thirty rooms, in addition to the basement, and without including any of the space in the wing of the main building. The passages and rooms will be 11ft. high, and insulation will be effected by the following plan of construction. On the first floor the brick wall will be 2ft. thick. On the inner face of the wall, a 2in. air space will be formed by the use of battens. Then follows a sheathing of 1in. boards, 6½in. patent granulated cork or silicate cotton (both insulating materials being employed in the building), a layer of 1in. boards, sheets of insulating paper, and then a layer of boards 1½in. thick. The inner dividing walls, where there are no bricks, have two layers of boards on each side with paper between, and 6½in. of insulating material as the main body, making 9in. over all. The floors and ceilings of the rooms are formed with a lower stratum of concrete 6in. thick, obtained by filling in between the main girders. On this concrete surface are laid pitchpine joists, 9in. by 3in., the space between the joists being packed with cork or silicate cotton. The final working floor is formed of two layers of tongued and grooved white-pine boards, 1in. thick. About 100 tons of ground cork, obtained direct from Portugal, has been used as principal insulating material, in addition to a considerable quantity of McNeill's slag wool.

The basement, first floor, and second floor rooms are cooled by the direct expansion of the liquid ammonia. The rooms on the top floor are cooled by the circulation of cold air. An air cooler has been constructed on the roof, by which, with the aid of a fan, air can be cooled and circulated through the rooms on the upper floor.

On the first floor, at one end of the building, a ten-stall stable has been formed, to and from which horses will travel by means of a sloping track or stairway.

The stores will accommodate 20,000 tons of food products of the kinds usually placed in cold stores.

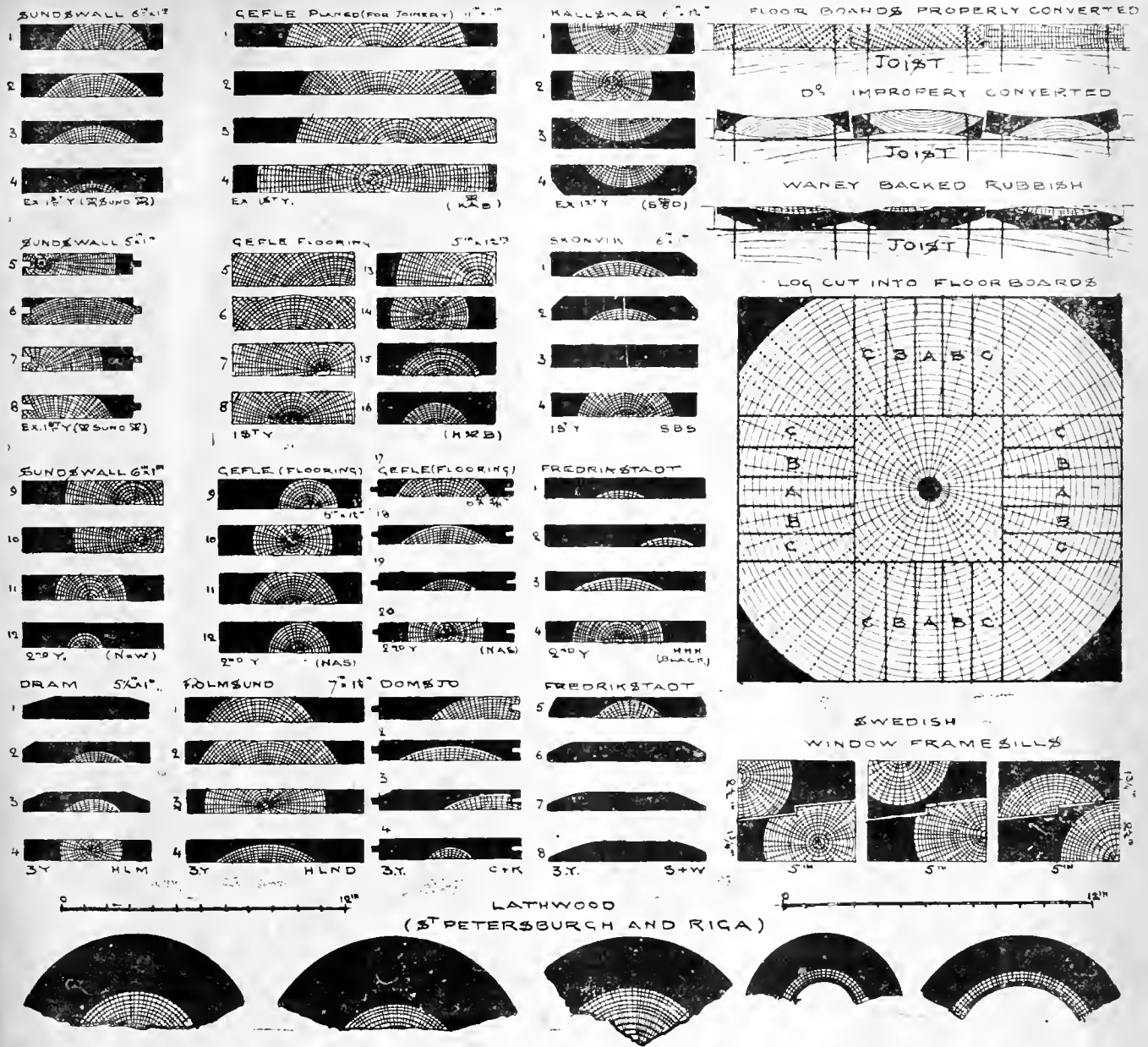
The buildings were erected from plans by Mr. Alexander Adam, architect, Glasgow. The excavating, brick, and stonework were carried out by Messrs. E. and J. Birrell, Glasgow. The installing of the machinery was carried out under the supervision of Mr. William Howat, engineer in charge.

ON BUILDING TIMBERS.—XXXVI.

FLOORING AND MATCHING.

IN the timber trade the expression "flooring" now means floor boarding which has been "prepared" or made ready for laying in a floor without the bestowal of any more labour than that which has been put in it in travelling through a steam-driven planing and thicknessing machine at the rate of close on four miles an hour! Should an architect ask for hand-worked flooring at any timber yard, the proprietor would for a certainty conclude his customer had come straight from Colney Hatch, for such a thing is at present wholly unknown to the trade, and every practical man knows that machined flooring is much better than any that can be worked on a joiner's bench—at least, so he says. Up to 1863, when Mr. Søren Weise, an enterprising Norwegian, took a Perth planing machine over to Fredrikstad, all our floors were laid with hand-prepared boards. Since that time the growth of the "prepared-flooring" trade has been so great and so rapid, almost every Norwegian and Swedish timber port joining in, that one never sees or hears of hand-prepared floor-boards, except in some building where the architect is a "crank" who likes to see his work well done. Indeed, it must be said, in justice to

the timber merchant, that he never laid himself out to prepare flooring, for that work was always done by the builder, who set about it the day the contract was signed. Two uprights and a horizontal piece, something like a "ledger" in scaffolding, made a "perch" on the building site, and this, carefully furnished with roughly-planed boards for the floors, each alternate board being fixed in opposite sides of the perch, made the first erection of a temporary kind which the builder was compelled to carry out by his contract. In those days the specification was worded thus:—"All the flooring boards must be stacked under cover on the site within fifteen days after signing the contract." The necessity for having well-seasoned boards was well understood—much better, in fact, than it is at present, when the specification apparently provides that "all the flooring-boards are to be foreign prepared, listed with sapwood and knots, the whole being carted from the Surrey Commercial Docks the day they are to be laid on the joists." Further on will be seen what kind of flooring is now used here. It has already been stated that two consignments of first quality prepared floor-boarding sent to the writer, one lot from London and the other from Southampton, fell so far short of what he considered decent material that he used both for rough-centring; so that this foreign flooring trade has displaced much good work for what is indifferent or wholly bad. In fact, really good floor-boards cannot be obtained "for love or money." Of course, the truth of this statement depends on what good flooring is. Well, here is a description of it: "A good floor should show no knots or sapwood; the annual rings must be at right angles to the face of the floor, or they shall not vary from a right angle more than 30° with it, and there shall be no open joints three years after the floor is laid." Now where can prepared flooring be obtained which is free from knots and sapwood, and is properly converted from the log, that is cut radially? Echo answers, like that in Paddy B'ake's garden, "No where." Like many other woods used in building, the wood "floor" is ambiguous; it may mean the joists and boarding in a "single-joisted floor"; it may mean the binding, bridging, ceiling joists and boarding of a "double floor"; or it may mean the girders, the three kinds of joists already enumerated, and the boards of a "framed floor." When the "ground floor," "first floor," or any other "floor" of a building is mentioned, the word applies to the whole story without reference to the construction of the actual floor, or the material in it; to prevent misunderstanding the word floor or flooring will be used here to mean floor boarding unless the contrary is stated. Writing from Clifford's Inn on October 14, 1667, one Stephen Primatt, a lawyer, anxious to protect "the noble suffering Citizens and Bees of this nation" from workmen and surveyors, who combined together "to make Harvest in the City Ruins" by taking excessive rates for their works, gives the following information about floorings. He says "every square will take up at the least eleven or twelve boards, they being ten, eleven, or twelve inches broad one with another, and about ten feet long, the rate of such boards you may reckon at seven pounds ten shillings for a hundred, which for every square comes to fifteen shillings; to this you may add four shillings for planing, laying, and for nails and nailing every square, which may be reasonable." All this information is very vague, for Stephen says nothing whatever about the thickness, or what the material is, of the lastly herein before mentioned boards; but he is not the only lawyer who, wading into building affairs, got out of his depth. In 1667, "Yellow Fir," he says, was called "Dram," and it came from "Longlound, Tonsberry, Swinsound, Mosse, Dronton, Bergen, and other places." The timber from these ports was doubled in price after the Great Fire, and deals fourteen or fifteen feet long and fourteen or fifteen inches broad were considered the "most decent for flooring." In 1726 Mr. Leybourn wrote about floor boarding as follows:—"The Price of Laying is Various, according to the Goodness of the Stuff, from 12s to 20s. the Square; but if the Boards be found by the Builder, then they commonly allow for Planing, Jointing, and Laying of Boards, 4s. or 5s. per square, besides Nails, of which 200 is a Competent Allowance for one Square of Flooring. But some Workmen in Sussex tell me they will lay Deal floors braded, and plain Joyns broken at every four or five Boards for 3s. per Square; and if they break



FLOORING, SILLS, AND LATHWOOD.

Joyst at every Board, then 6s.; others say 6s. 8d. or 7s. per Square." The lapse of 170 years saw a great difference in the builder's opinion as to the best widths for floor-boards, for Primatt in 1667 considered 14in. and 15in. the widths "most decent" for good boards; and in 1832 Richard Elsam wrote: "Dry, well-seasoned, clean yellow deal battens not more than 4in. or 4½in. wide are the best sort of boards which can be introduced for floorings, for the boards are less liable to shrink than when they are wider." Other things being equal, wide boards make better floors than narrow ones, for there are fewer joints in the same area, and there is much less labour in laying them. To use narrow boards only because they shrink less than wide ones is to encourage the builder to use unseasoned material. At the present day the commonest floors are laid with narrow boards, "folding." This means that five or six boards are cut to the same length and forced down on the joists into a space an inch or so less in width than they would occupy if they were laid together, side by side, without pressure. Suppose, for instance, that six boards are to be laid, each of which measures 6in. wide. Here the whole would cover 3ft., if laid side by side on the joists; but, as the boards would shrink if nailed down in this way, the two outer boards are first nailed firmly to the joists 2ft. 11in. apart, two more are laid flat against them, and the two last, which will not, of course, go into the 11in. space left, are laid down with their inner edges raised against each other: a board is placed traversing these, and the workman jumps on it,

squeezing the whole together, so that the six boards are driven into and occupy a space of 2ft. 11in. instead of 3ft. The ends of the six boards come together on one joist, an arrangement which is considered objectionable: when, therefore, a number of heading joints are seen to be in line in any floor, it is obvious the boards have been laid "folding." The next best floor is that in which the boards are laid "straight joint." In this kind of floor no two adjoining boards are cut to the same length, all the heading joints are broken, each board is laid singly with flooring "cramps," "irons," or "dogs," by means of which every board is forced tightly against that previously laid, before it is nailed down. In folded and straight-joint floors, when the boards shrink, dust and other matters pass through to the ceiling underneath, which is objectionable. To prevent this leakage, when boards were hand worked it was usual to rebate the under sides along both edges to a depth of about ¼in. and ½in. wide, so that when the boards were laid a fillet from 1½in. to 1¾in. wide was placed under the joints in the rebates of two adjoining boards; in some cases these fillets were let into the joists flush with their upper surfaces; such a floor was "rebated and filleted," or "filleted" only when the fillets were set flush in the joists. Boards are now "ploughed and tongued" in good work; in a floor of this kind each board is grooved on one edge and tongued on the other, the tongue fitting exactly into the groove; boards are sometimes grooved only on both edges, the tongues being of wood or hoop-iron; it is of great importance in this class of

work to keep the groove as near the underside of the board as possible to prevent the wood in the upper or face side of the board curling up through being too thin. The heading joints in all good floors should be broken, and the ends of the boards should be ploughed and tongued as well as the sides. A good floor is made by rebating each board on both edges, from the top at one side and from the bottom on the other side, the rebate being reversed in fact; the rebate may be made deeper from the face than from the underside, and shallower from the underside; this gives a good working thickness to the upper edge of the rebate. In a floor of this kind one edge of each board need only be nailed: the rebate secures the other edge under the nailed edge of the next board. Dowelled floors were much commoner in good work than they are at present. Nails are not seen in the boards of a floor of this kind, for they are driven skew through the edges of each board to the joists. The first board laid in a dowelled floor is nailed through the face, close to the wall, where the nails will be covered by the skirting, all the other boards are secured with nails and dowels which are completely hidden. A number of boards to be dowelled are placed on the bench side by side edge up, across these, at right angles to the face are ruled lines about 16in. or 18in. apart; down the centre of the edges of the boards other lines are marked, and the intersections of these with the cross lines give the position of the dowel holes, which are bored with a brace and bit to a depth of about 1in. or 1½in., and into these holes dowels, usually of oak and about the size of a lead pencil, are driven.

faces of some boards the wavy surfaces produced by the planing-irons are distinctly seen. It is not to be questioned that if the irons in a machine are carefully sharpened and run at a high velocity with ample power, whilst selected straight-grained stuff is passed through it at moderate speed, well-prepared boards can be obtained; but these are not the ordinary conditions under which boarding for commercial purposes is turned out, and it may be safely asserted that the surface of a machined board is never equal in finish to that of a hand-planed board turned out by a first-class joiner. Hand-prepared floor-boards were never planed on the under side; it was always left rough as from the saw, and the axe was used to thickness it when it rested on the joists. The accompanying sketches show floor-boards of different qualities from Sundswall, Gefle, Fredrickstadt, Domsjö, Holmsand, Dram, Kallskar, and Skonvik. Sapwood is seen in nearly all of them, and not one is converted as it should be for flooring—that is radially, as shown on the large log on the right. On this log A, B, and C are boards cut as they should be for a floor; but if these were cut at right angles to their present lines they would be unfit for the purpose, as the rings would scale up on the surfaces from traffic and repeated washing. The three floor-boards on the top over this log show properly converted boards, and the two rows under show improperly converted boards and waney-edged slabs, which should not be allowed in any building. Six sash-frame sills are also shown, to give some idea of the class of work now imported. The life of one of these sills cannot be much more than 10 years at the outside, yet they are extensively used in speculative building in and all round London. Lathwood from Petersburg and Riga is, as will be seen from the five examples given, nearly all sapwood, and this is the class of wood invariably used for laths at present when they are cleft in the country. The accompanying tables (on page 336) of the present wholesale prices of flooring and matching will be of great use to architects and surveyors, as well as to builders. The tabular form is adopted to facilitate easy reference.

A HANDBOOK ON BUILDING CONSTRUCTION.*

THIS book, to which we draw attention to-day, has already been previously noticed in the *Building News*; but readers will be glad to know that the publisher, Mr. Batsford, has just issued the fourth edition in a "thoroughly revised and much enlarged" form, the whole being compiled to assist students preparing for the May Examinations of the Royal Institute of British Architects, the Surveyors' Institution, and the Board of Education. The authors are Messrs. Charles F. and George A. Mitchell. The success of their well-known work is the best guarantee as to its thoroughness and up-to-date character which distinguishes the volume. In point of bulk it bids fair to approach speedily the portly form of the once famous "Gwilt's Encyclopedia." The handy use of a book is, however, impaired when it takes too thick a shape, and for this reason we should prefer the work in two volumes, though at the same time no doubt a duplicate index is always more or less a nuisance, especially when a reference has to be made in a hurry. In a somewhat large appendix in the edition now before us, the Board of Education syllabus, published only on August 1st, 1903, is given, together with the examination papers on Building Construction for the past four years, with their plans and diagrams complete. Other papers are reprinted from the War Office Surveyors' Examinations and the R.I.B.A. Final for 1902. The additions to this edition are notably chapters on Electric Bells, Lightning Conductors, and Lighting by Electricity, treated in a concise form. It is beyond our limitations of space to go at length through this admirable and practical book for students. It covers too large a field and comprises too many subjects to permit of such a notice, even if such an extended review could serve any purpose just now. Every student, whether he is going in for an examination or not, will find Mr. Mitchell's book on building a ready and valued friend.

YORK CITY ASYLUM.

[WITH ILLUSTRATIONS.]

THE land purchased by the corporation as an asylum site comprises 156 acres. Of this area 128 acres are situate in the parish of Naburn and 28 acres in the parish of Water Fulford. The whole of the new buildings, with the exception of the isolation hospital, will be erected in the latter parish, as shown on the block plan. The extreme length of the buildings from north-east to south-west is about 740ft., and the depth from north to south 450ft. The approach to the asylum will be from the north end of the estate—i.e., the end nearest to York. A lodge will be built at the entrance-gates, to be occupied by an employee of the asylum visiting committee. The present accommodation is for 362 patients, but the administrative department is sufficiently large to allow for a further extension of two ward blocks to accommodate 124 additional patients—viz., 74 females and 50 males, thus bringing up the total accommodation of the asylum when completed to 284 females and 202 males, making a grand total of 486. The buildings are arranged somewhat in the form of a fan, the handle being represented by the main approach avenue, the outer edge of the fan representing the ward blocks—i.e., the part of the asylum that will be devoted to the use of patients. There are three blocks on each side of the centre, all facing south-east; those on the north-east side are for males, and those on the south-west for females, with accommodation for two assistant medical superintendents placed between the two sections.

The accommodation provided is in accordance with the requirements of the Lunacy Commissioners. The following table contains the details:—

Female side—		Block A.	
Epileptic, ground floor	40		
Chronic, first floor	40		
			—80
		Block B.	
Recent and acute, ground floor	30		
ditto ditto first floor	30		
			—60
		Block C.	
Sick and infirm, ground floor	35		
ditto ditto first floor	35		
			—70
Total females			—210
Male side—		Block D.	
Sick and infirm, ground floor	25		
ditto ditto first floor	25		
			—50
		Block E.	
Recent and acute, ground floor	20		
ditto ditto first floor	20		
			—40
		Block F.	
Epileptic, ground floor	30		
Chronic, first floor	32		
			—62
Total males			—152
Total males and females			362
Female side—		Extension blocks.	
Chronic, ground and first floor			74
Male side—		Chronic, ground and first floor	50
Total extension blocks			—124
Grand total			486

At the end of the main avenue is the entrance block. This has been planned to face north-west, and will be the nearest building of the main block to the city. It will provide porter's room, medical superintendent's office, assistant medical superintendent's office, clerk's office, committee-room, luncheon-room, room for chaplain (also used as a library), bakery, and steward's office, with lavatories and other conveniences adjacent. The upper floor will contain officers' quarters. On the left of the entrance block, facing north-west, are the engine-house, boiler-house, and workshops, with the steward's yard, engineer's yard, and the workshop yard. On the right of the entrance block, facing north-west, is the laundry block, with drying-ground; also sewing-room and general bathroom for female patients.

The space between the ward blocks and the departments above described is occupied as follows:—In the centre the administrative block, including steward's store, kitchen with the necessary larders, storerooms, and sculleries. These are flanked on the right by female visiting-room, servants' and nurses' messrooms, and nurses' recreation-room, with servants' bedrooms on the first floor, the left flank being occupied by similar accommodation for the male staff and male attendants. Between the administrative department and the assistant medical officer's block is the dining and recreation hall; also accommodation for matron and head

attendant, together with a dispensary and pathological room. The assistant medical officer's quarters are placed between the male and female wards, and so as to overlook the airing-courts. The general bathroom for male patients and the workshops for cobbler and tailor are immediately behind the engine and boiler-house block. Separate entrances and exits are provided for each floor of the six ward blocks, the dayrooms on ground floor being provided with additional exits opening direct into the grounds; these will be glazed and serve as windows. The ceilings of first floor immediately under the roof will be fire-resisting, in accordance with the requirements of the Lunacy Commissioners. Corridors of communication are designed so as to give the shortest and most direct means of communication with the wards from the administrative department. Subways will be constructed under the corridors of communication, laundry-blocks, ward-blocks, dining and recreation hall, entrance-block, and administrative-block, &c. In these subways will be placed all steam-pipes, hot and cold water pipes, electric-cables, telephone-wires, &c., and the engineer in charge will by this means obtain access to pipes, cables, &c., without passing through the asylum.

A water-tower will be erected adjacent to the engine-house; the height to the bottom of tank will be 90ft., and the capacity 18,000 gallons. Pumps in duplicate will be used for supplying the water tank; the supply will be from the York Waterworks Company. Hydrants will be placed in suitable positions around the building inside and out. Specially large hydrants will be placed in suitable positions for supplying the Corporation Fire Engine. The inside hydrants will be placed in convenient positions with two or three lengths of hose attached to hydrant ready for use. Hose couplings will be Morris's Instantaneous, and will be similar in every way to, and interchangeable with, the fittings of the Corporation Fire Brigade. Fire alarms and telephones will be provided throughout the buildings. Rainwater will be stored in two underground tanks, and will be used for laundry purposes and boilers. In the event of rainwater giving out, York Waterworks Company's water will be used. The medical superintendent's house will be placed between the female side of the asylum and the Naburn-lane. Six cottages for the accommodation of employees will be erected adjoining the Naburn-lane, and the isolation hospital will be built about 550ft. to the north-east of the main asylum block.

The heating will be by means of exhaust steam from electric-lighting engines, pumps, &c., and will be augmented, when necessary, by live steam passed through a reducing valve and reduced thereby from boiler pressure to atmospheric pressure. The steam at atmospheric pressure will be drawn by means of a vacuum into the various radiators. Each of these will be controlled by a thermostatic valve. This will allow air and water of condensation to pass away through the vacuum mains to pump-room in engine-house block. Each radiator will be arranged so that the access of fresh air can be regulated before it passes over the radiators into the rooms. Foul air will be extracted by means of air-ducts leading to extraction towers placed between each ward block. Each of these towers will be provided with a heating coil (connected to hot-water system, so that it is available in summer and winter alike) to provide the necessary circulation of air through the buildings. The chapel will also be heated on the atmospheric system, and, like other parts of the asylum, will be supplied with steam direct from pump-room. The dining and recreation hall, however, will be heated and ventilated on the Plenum system—fresh air being drawn from a small tower by means of a fan, and forced through heating coils, after which it will pass along underground air-ducts and discharge into the room at a height of about 8ft. above floor level, through wall-flues connected with the underground air-duct. Vitiated air will discharge through a shaft carried above the roof. The hot-water supply will be generated by two tubular heaters fixed in pump-room. The heaters will be arranged with connections, so that exhaust steam from engines can be utilised all the year round. Whenever there is an insufficiency of exhaust steam, live steam will be supplied to the heaters. The heaters will be connected up in duplicate, so that they may be worked independently of each other. Circulating pipes will be laid along the subways, with branch circulations to all draw-off points. To insure quick circu-

* Advanced Building Construction. Fourth edition, 689 pages 8vo. Price 5s. 6d. London: B. T. Batsford, 1903.

lation throughout the system duplicate pumps will be placed near heaters in pump-room. Two Lancashire boilers, each 30ft. long by 7ft. 6in. diameter, and working at a pressure of 125lb. per square inch, will supply steam for engines and pumps. Additional steam required for heating, cooking, laundry, &c., will be reduced to required pressures.

The estimated cost of the work, exclusive of architect's fees, laying out airing courts and kitchen garden, is £133,000. This works out at £280 per bed, exclusive of land. The architect is Mr. A. Creer, Assoc.M.I.C.E., city surveyor, York. Mr. Jno. C. Light, is the clerk of the works.

OBITUARY.

MR. THOMAS WILKINSON WALLIS, the well-known carver, has passed to his rest, ripe in years. The eighth child of a Hull cabinet-maker, Thomas Wilkinson Wallis was born in Matchell-street in that town on February 4, 1821. At fourteen he was apprenticed to a carver and gilder named Thomas Ward, also of Hull, being "out of his time" in 1841, when he immediately started work as a journeyman for his old master at 24s. a week. In 1843 he went to Louth, and was in turn employed by a local carver named John Brown at a salary of 23s. a week. At the age of twenty-three he started in business, embarking thereupon his life savings, which amounted to £26 13s. 2d. Very soon his talent brought him well-earned reputation. He first exhibited in London at the Society of Arts, and later at the 1851 Great Exhibition. He was there awarded the gold medal, and at the Paris Exhibition of 1855, and the International one in London in 1862. A most diligent handicraftsman, his naturally rather weak eyes began to fail him seriously at forty. Since then the outcomings of his cunning hand had been limited. He became borough surveyor of Louth, occupying that position for some twenty years. Old age and infirmities telling upon him, his latter days have been spent mainly in his garden. As a portrait-painter he particularly excelled—a life-sized presentation picture in oils of Mr. Harry Hems, of Exeter (1901), a life-long friend and admirer of the venerable sculptor, being one of the many admirable works of the kind he produced. Mr. Wallis died on the 26th ult. in his 83rd year.

MR. HERBERT FORD, F.R.I.B.A., whose death at Blackheath on Tuesday week, at the age of 70, we briefly announced last week, had practised in the City as an architect for upwards of forty years. Mr. Ford was well known as an expert in the designing of woollen and silk warehouses, of which he had designed and superintended in the City some four hundred, in addition to planning many schools, private residences, and chapels. In later years Mr. Ford was associated as partner with Mr. W. J. Burrows, and to the firm was intrusted the carrying-out of such important blocks of buildings as Messrs. Pawsons and Leafs, and Messrs. J. Howell and Co., St. Paul's Churchyard; Messrs. J. Rotherham and Co.'s premises in Shoreditch; Messrs. Stapley and Smith's factory at Hackney, and extensive alterations to their London Wall premises; large blocks of offices in Cheapside, Milk-street, Aldermanbury, Holborn, and Southampton-row; intricate alterations to the Phoenix Assurance Company's premises in Lombard-street; the restoration of twelve warehouses demolished by the great Cripplegate fire; and several blocks of schools. Most of the buildings necessarily involved complex questions of party-walls, boundaries, and ancient lights.

MR. EDWARD RICHARDS, architect, of Torquay, died on Thursday morning in last week, at the age of 61 years, as the result of being thrown from his pony-trap on the previous Saturday, whereby he sustained a fracture of the skull and other injuries. Mr. Richards was well known and much respected in South Devon. As an architect, he had been identified with many public buildings in the town. His competition design a few years since for a pavilion was selected, but the scheme was afterwards abandoned. He was also architect to the Maldon manor for many years, an excellent vocalist, a prominent local Conservative, and a member of St. John's Lodge of Freemasons. He sought on one or two occasions to enter the town council, but his candidature was not successful.

The death took place at his residence, Daldri-shaig, Aborfoyle, on Monday of Mr. J. M. GALE,

who for 43 years, and until the close of last year, was chief water engineer of the Corporation of Glasgow. Mr. Gale was born at Ayr in 1830, and received his education in Ayr Academy, and later in the University of Glasgow. In 1855 he was appointed resident engineer on the Loch Katrine water scheme of the city of Glasgow, and four years later, on the completion of the works, engineer-in-chief. During his occupancy of that post he constructed a second aqueduct from Loch Katrine, doubling the water supply of the city. Mr. Gale occupied a high place in his profession, and was one of the most strenuous servants of the corporation. He resigned in December of last year owing to ill-health. He is survived by his widow and a son and daughter. His son is now chief assistant to Mr. Sutherland, who succeeded to the post formerly held by his old chief.

THE death of Mr. GEORGE BRINTON, partner in the firm of Messrs. Brinton and Bone, builders and contractors, Southampton, took place on Monday week at his residence in Westwood-road, at the comparatively early age of 56 years. The deceased gentleman, who has been seriously ill for some six months, was the eldest son of the late Mr. G. S. Brinton, J.P., of East Park House, who entertained Garibaldi on his visit to this country during the time that he was Mayor of Southampton in 1863. The funeral took place at the Southampton Cemetery on Thursday. A numerous deputation attended, representing the Southampton Master Builders' Association, of which the deceased was formerly president.

At Hammersmith, on Monday, an inquiry was held concerning the death of EDWARD B. SMITH, 49 years of age, a builder, of Mall-road, Hammersmith. The evidence showed that the deceased had been unnecessarily depressed because his business had not been so good as formerly. Early on Friday morning he was found insensible in bed, and died soon after the doctor arrived from carbolic acid poisoning. The purchase of a bottle of carbolic acid the day before was proved, the deceased telling the chemist that he was a builder, and wanted it for drains. A letter to the deceased's son, a private in the Rifle Brigade, at Cairo, was found, in which he wrote:—"Trade in London is exceptionally bad, and money is most awfully tight. I am far from well, and everything seems too trying for the nerves." A verdict of suicide whilst of unsound mind was returned.

CHIPS.

An addition was made to the tramway routes in Leeds on Wednesday week, when a new service of cars commenced to run from Malvern-road, Beeston-hill, to the Cardigan Arms, Kirkstall-road.

Sir Frederick Bramwell, the arbitrator appointed by the Board of Trade, will visit Rochdale next week to view the tramway lines which are about to be acquired by the corporation from a private company, and a long interval is not likely to elapse before the arbitration proceedings proper take place and the award is made. Sir Frederick has had many years' experience in this kind of work. It was on one of his awards that the Courts decided that the Act of 1870 prohibited any allowance for goodwill in the compulsory acquisition of tramways undertakings.

The great statue of Vercingetorix, which is being erected as a national memorial at Clermond-Ferrand, has been safely placed upon its pedestal, a work of some difficulty, in view of the fact that it weighs over 12 tons.

In the case of the application made for discharge on behalf of Edward Maynard, Brockley, Kent, builder, the discharge has been suspended for six months, ending Jan. 31, 1904.

The Archbishop of the West Indies has now received information about the damage resulting to Church property in Jamaica through the cyclone of August 11, and is appealing to English friends for help to meet it. Five churches were wrecked, 33 mission chapels destroyed, 44 mission chapels seriously damaged, 12 parsonages wrecked or seriously damaged. This list does not include many minor injuries, and the estimated cost of rebuilding and repairing is £15,000.

At the monthly meeting of the town council of Cheltenham on Monday the mayor announced that the new town-hall was expected to be ready for opening at the end of September or beginning of October. It was reported that the Local Government Board had given sanction to a loan of £14,447 for the purposes of wood-paving through the principal business streets along the route of the proposed tramway extension.

Building Intelligence.

BANGOR CATHEDRAL.—The formal reopening of the chancel of Bangor Cathedral after renovation took place on Friday. The whole of the fresco work has been carried through at the expense of Lord Penrhyn. During the period he held the archdeaconry of Bangor and Anglesey the late Dean Pryce was greatly concerned about the condition of the fresco work, which had considerably decayed, owing to damp and other causes, some of the figures having altogether disappeared. Immediately upon becoming dean he took in hand the work of renovation. The London firm who executed the original frescoes were engaged to renew the work in oil colours, and for them the decoration was carried out by Mr. Castle. A delineation of our Lord in Majesty, supported by angels bearing censers, fills the space above the east window, on each side of which are tiers of saints. On the south side, and on the lower tier on the north side as well as on the south, are also representations of saints and Apostles.

MANCHESTER.—The new hotel which the Midland Railway Co. have built close to the Central Station, Manchester, was opened on Saturday. The site covers two acres in Peter-street, and five years have been occupied in clearing the ground and putting up the new building. The architect is Mr. C. Trubshaw, and the contractors were Messrs. William Brown and Son, of Salford. The building is of six stories, and is 100ft. in height. For 26ft. from the pavement the front elevations are of red Aberdeen granite, with granite bands, and thence to the roof of terracotta blocks. The style is of a rather freely adapted Renaissance. The hotel overlooks Peter-street, Moseley-street, Mount-street, Windmill-street, and the open space of the Central Station yard, with which it is connected by a light iron-built, glass-roofed way. Brown vitrified terracotta is extensively used in the treatment of the building. The lofty walls of the inner building, rising on four sides high above the glass roof of the interior garden, are similarly treated with glazed white tiles. By a series of filter-screens of linen and coke hung across the windows all impurities are removed from the incoming air. Within the entrance hall are a post and telegraph office, a telephone exchange, and a railway booking-office. There is a large concert-hall, rich in variegated marbles; it will accommodate 850 persons. The panelling is of Cuban mahogany, and the style Louis XIV. There are several dining-rooms, including a French restaurant, coffee and grill rooms, and German restaurant. The grand dining-room is panelled in mahogany, with embellishments in gold; the ceiling is painted white, picked out with gold. A feature of the hotel is the arrangement of the rooms in suites, which are self-contained. There are 300 bedrooms. The suites grade into each other according to the periods—Elizabethan, Jacobean, Georgian, Louis XIV., and Adams all being utilised. The fireproof flooring has been carried out by Messrs. Mark Fawcett and Co., of London.

ROYAL ARCHITECTURAL MUSEUM.—The work of altering and adapting the buildings of the Royal Architectural Museum in Tufton-street, Westminster, for the purposes of the Architectural Association is now proceeding rapidly, from plans by Mr. Leonard Stokes, which are published in the current issue of the *A.A. Notes*. The evening school classes and studios will be accommodated on the first and second floors respectively, while the day school will have its studios on the third floor. The members' common room is situated on the ground floor, and arrangements will be made for supplying light refreshments as at present, while the reading room is provided in close proximity to the library, so that members may study or read quietly any books borrowed from the library either during the daytime or before their lectures or classes commence. The meeting room will be on the first floor, and will be an apartment 73ft. long by 25ft. wide. The museum will be open to the public as heretofore, but upon evenings when lectures are to be held members will be able to draw from the casts, the same facilities, of course, being afforded in the daytime. The contract entered into with Messrs. Holloway Brothers involves an expenditure of £8,440, and the expenses of furnishing and equipment will probably need a further sum of £1,500, making a total of about £10,000. Towards this the committee have

received in donations and promises about £4,500, so that a large balance still remains to be collected. Arrangements have already been made for a 999 years' lease, and Lady Day next will witness the removal of the Association to its new habitation.

CHIPS.

We regret to learn that Mr. Greville C. Hems, eldest son of Mr. Harry Hems, is still lying dangerously ill at Fair Park, Exeter. Three months ago an operation was performed, but without beneficial effect. He has been detained in bed since then, and is in a very precarious condition. Mr. Greville Hems is unmarried, and is thirty-four years of age.

The death occurred in Berlin on Monday of Professor Frederic von Kaulbach, one of the most famous of German portrait painters. In addition to a number of well-known popular pictures, he also painted the portraits of many members of the Courts of Hanover, Austria, Prussia, and Russia.

On Saturday, limestone was sent out from the new quarry near Bishop Middleham, Ferryhill, Co. Durham. The railway company supplied waggons for the first consignment. The quarry area is of considerable extent, and it is expected that before the end of the year employment will be found for 100 workmen.

At the last meeting of the Newcastle-on-Tyne city council the adjourned debate on the motion to confirm report of the new town-hall committee, recommending the council to approve of land in Northumberland-street and Northumberland-road, as a site for town-hall and municipal buildings, was resumed. An amendment was carried rejecting the proposed site as too expensive.

At Prudhoe-on-Tyne the foundation-stones were laid on Monday of a new parochial hall, estimated to cost about £1,500. A site adjacent to the vicarage has been given by the Duke of Northumberland. Messrs. Watson and Son, of Branch End, Stockfield, are the contractors, the architect being Mr. S. D. Robins, of Newcastle. The hall will measure 59ft. by 24ft. 6in., and will seat 500 persons.

The Rev. Michael Pryor appeals for donations towards the restoration and extension of Holy Trinity Church, at the Fort, Margate, of which he is vicar. The work is necessary, as the external fabric has been crumbling for some time, and the safety of the building is to some extent imperilled.

Good progress is being made with the restoration of the fine church of St. Margaret, Cley-by-the-Sea, Norfolk. The roof of the south nave and aisle and the roof of the north aisle are being renovated at a cost of £2,000, Messrs. Cornish and Gayer, of North Walsham, being the contractors. As funds permit, other works will be undertaken at an estimated further outlay of £5,000. These will include the repair of the west porch and the whole of the external masonry.

A stained-glass window has been erected in the Roman Catholic Church of Our Lady and St. Helen at Southend-on-Sea. The chief subject is the Crucifixion, the great central figure being attended by the Virgin and St. John, St. Mary Magdalene, Helen, and Joseph.

The Bishop of Bangor has laid the memorial stone of a church which is in course of erection, at an approximate cost of £4,000, at Nevin, a watering place on the north coast of South Carnarvonshire. The church has been designed by Mr. P. Shearson Gregory, architect, Bangor.

The memorial stone has been laid of the new Reformed Presbyterian Church at Larne. The building is being erected on the Curran-road, adjoining the new Victoria Orange Hall. The interior dimensions are 50ft. by 32ft., whilst the height to the eaves is 18ft. The total seating accommodation of the church will be about 330. Behind the church are situated a minister's room and a session room, divided by the heating chamber. Mr. J. Scott, Annandale-avenue, Belfast, is the architect of the new building, and Mr. Hewitt, Ballyhackamore, the builder.

The Housing Committee of the city council of Liverpool have received the sanction of the Local Government Board to the scheme for erecting 60 houses in Clive and Shelley-streets, Toxteth Park. The city surveyor, Mr. T. Sheldermine, has been instructed to obtain tenders.

At St. Mark's Church, Tunbridge Wells, an Italian Gothic building, erected eight-and-thirty years ago from the designs of Messrs. Roumieu and Aitchison, of London, a baptistery is about to be added as a western narthex, in accordance with the plans originally prepared by that firm. This will complete the architects' scheme.

A highway bridge is about to be built at Worthing, Norfolk, for the Mitford and Landitch Rural District Council. The engineer is Mr. Silcock, of Leeds.

COMPETITIONS.

JOHANNESBURG.—Mr. Thomas A. Moodie, who left Glasgow for South Africa to take up the position of principal architect of the Central South African Railway Company at Johannesburg, was recently selected as one of the architects to take part in the limited competition for the new railway offices at Johannesburg. Mr. Moodie's plans have now been selected, and arrangements are being made for the carrying out of his design, which is estimated to entail an expenditure of half a million sterling.

LIVERPOOL.—The Liverpool Corporation have invited seven architects to compete in a limited competition for the erection of new public baths, St. George's Dock. The seven names were selected from the competitors in the original competition for the St. George's Dock site baths in connection with which Sir William Emerson was the assessor. The three authors of the premiated designs in the first competition—viz., Messrs. Stones, Stones, and Sproakes, Messrs. Briggs, Wolstenholme, Hobbs, and Thornely, and Messrs. Matear, Simond, and Crawford—are included, and also Messrs. A. Hessel Tiltman, A. Saxon Snell, S. B. Russell, and H. Dighton Pearson. The buildings are to cost £75,000. The drawings (one-sixteenth scale sketch plans) are to be sent in on Sept. 24.

LURGAN.—The Lurgan Urban District Council has held a special meeting for the purpose of appointing an architect to design and superintend the erection of a free public library to be built on the new street off Market-street, on which a free site of 100ft. frontage has been granted by the council in conformity with the conditions on which Mr. Andrew Carnegie has offered a gift of £2,000. The recommendation of a special committee in favour of the appointment of Mr. Henry Hobart, C.E., Dromore, was unanimously adopted.

MANCHESTER.—A "Life Trustee" of the Manchester Royal Infirmary writes to the local journals objecting to the methods adopted by the Board for obtaining designs for the new infirmary proposed to be erected opposite Whitworth Park. The invitation of selected competitors is, he points out, more costly than open competition. Twelve architects have been invited to prepare designs for the infirmary, and each is to be paid £100—£1,200 in all. In the recent chief fire-station competition for Manchester, "Life Trustee" mentions, the corporation paid £300, and for the technical school £325, in premiums. In both cases some 20 to 30 designs were submitted by prominent architects from all parts of the country. Both these buildings are more complex and technical in planning and construction than an infirmary. "If," he adds, "the infirmary board had offered similar premiums they would have obtained some 20 or 30 or more designs from the best men, as the proposed buildings will be so extensive and prominent that every architect who has had experience in this class of work would have been tempted to compete. The board, by their unfortunate policy, have therefore involved the institution in a probable loss of about £800 without obtaining any advantage in return whatever, and they have, moreover, prevented a large number of experienced architects willing to compete from doing so, obviously to the direct injury of the institution, whose interests they are expected to safeguard." The "Life Trustee" proceeds to criticise the architects selected to compete, which he terms "crude in the extreme." "Thirteen in all are concerned—twelve competitors and one assessor. Three of the thirteen are Glasgow men. Two or three years ago the Glasgow authorities required plans for a large infirmary of 1,200 beds, and plans prepared by Messrs. Schultz and Howard, of London, were selected. Everyone would naturally expect that these architects would receive a pressing invitation to compete for the Manchester Infirmary, and that the Glasgow architects, either unwilling or unable to provide their own city with suitable plans, would have been passed over. But Messrs. Schultz and Howard are not competing, and of three Glasgow architects two are competitors and one is the assessor. Precisely the same want of consideration has occurred with reference to Manchester architects. In 1896 the late board arranged a competition for an infirmary to be erected on the present site. Most of the unsuccessful Manchester architects on that occasion have been asked to compete a second time, instead of others being offered an opportunity of doing so. Several of those who failed in 1896

have received a second invitation, and other architects desirous of competing have been rebuffed."

PONTEFRAC.—The Pontefract Town Council have approved the plans presented by Messrs. Garside and Pennington for the proposed free library for Pontefract. The new building will occupy a site in Salter-row on the present lawn in front of the municipal offices. The cost is estimated at £2,000, whereas Mr. Carnegie's offer was a grant of £2,250.

PROFESSIONAL AND TRADE SOCIETIES.

ARCHITECTURAL ASSOCIATION.—A visit of the members will be made to the city of Bath a fortnight hence. It is proposed to travel on Friday evening, September 25, and dine upon arrival. The Bath Stone Quarries will be visited early the next morning, and in the afternoon Mr. Mowbray A. Green has undertaken to conduct the party round the city. As the party must number 30, members wishing to take advantage of this interesting visit should communicate at once with the secretary, at 56, Great Marlborough-street, W.

SEWAGE MANAGERS IN LEEDS.—A meeting of the Association of Managers of Sewage Disposal Works was held on Saturday morning in the Queen's Hotel, Leeds. Mr. W. D. Scott-Moncrieff, the president, occupied the chair, and the attendance numbered about sixty members. The Lord Mayor (Ald. J. Ward) extended a welcome to the association, and remarked that the work of the association was of the first importance to all communities. They had in most cases to deal with a system of drainage put down when the idea of sewage being dealt with, more especially in respect of trade effluents, was foreign to the general mind, and the many difficulties which had to be overcome to-day would be the more easily dealt with by assembling, as they had done, in various centres and gaining what information they could about the experiments conducted in those places. The President then inaugurated the Yorkshire District Branch and presented certificates of membership, prophesying as he did so a successful career for the branch. Colonel Harding, Chairman of the Leeds Corporation Committee, explained the experiments recently made at the Knostrop and Rodley Sewage Works. He admitted that the Leeds drainage system was a somewhat ancient one. They could, however, convey 50,000,000 gallons to their works. The Knostrop works were antiquated, though at the time they were started they were considered sufficiently effective. They were only suitable for the treatment of solids, and their capacity had now become insufficient to enable them to carry out even processes of precipitation properly. The area was too small. Dealing with the experiments at Knostrop, he said they were begun in 1897, and the processes of contact filtration and trickling filtration originated by them were now carried out on a large and practical scale by Manchester and other large centres. At the conclusion of the address the members left on a visit of inspection to the various local sewage works under the guidance of Colonel Harding.

The marriage arranged between Mr. Hubert C. Corlette, A.R.I.B.A., of 2, New-square, Lincoln's Inn, second son of the late Canon J. C. Corlette, D.D., Oxon, rector of Ashfield, Sydney, N.S.W., and Florence Gwynedd, third daughter of Mr. Arthur D. Berrington, of Pant-y-goitre, Monmouthshire, will take place on October 7.

At the last meeting of the Meath County Council, held at Navan, there were twenty-two applications for the position of surveyor in the rural district of Dunshaughlin. Only two of these were proposed—viz., Thomas O'Brien, Swanlinbar, County Cavan, and C. L. Bomford, Kells, County Meath. The former was selected. A large percentage of the applications were from England.

St. Chad's Church, Shrewsbury, was reopened on Sunday, after undergoing renovation, including installation of the electric light. Messrs. Williams and Son, of Princess-street, Shrewsbury, carried out the works.

At Monday's meeting of Aberdeen Town Council a report was received from the gas and electric lighting committee recommending a retiring allowance of £250 per annum to Mr. Alexander Smith, who, after many years service, has, on account of continued ill-health, resigned the office of engineer of the Corporation Gasworks. On a division, the allowance was fixed at £150.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLVII., XLVIII., XLIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXVIII., LXXIX., LXXX., LXXXI., LXXXII., LXXXIII., LXXXIV., LXXXV., LXXXVI., LXXXVII., LXXXVIII., LXXXIX., LXXXX., LXXXXI., and LXXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—N. D.—F. R. S.—W. L. C.—W. H.—G. R.—E. P.—E. C. K.—E. K.—G. J.—W. L.—C. L.

Correspondence.

BRICKS IN BRUNSWICK SQUARE.

To the Editor of the BUILDING NEWS.

SIR,—I have seen it lately stated that when the houses on the south side of Brunswick-square, London, were erected during the early part of the last century, the builders, to evade the brick-tax then in vogue, built the lower parts of these dwellings in bricks of enormous size, and, also, that before the upper walls were executed the tax had been taken off, when bricks of ordinary size were employed. Can any of your readers furnish further particulars, or give other instances of this amusing evasion of the law?—I am, &c.,

A BRICKLAYER.

Re HERBERT FORD, DECEASED.

SIR,—Advertising to your Obituary notice in last week's issue of the BUILDING NEWS, we beg to inform you that Mr. Hesketh's connection

with this firm ceased many years since, and that the practice has for years past been carried on by your obedient servants,

FORD, SON, AND BURROWS.
21, Aldermanbury, E.C., London.
Sept. 9, 1903.

Intercommunication.

QUESTIONS.

[12002.]—Norwich.—The week before last, in a notice of a guide book descriptive of Great Yarmouth, incidental reference was made in your columns to the architectural attractions of the neighbouring city of Norwich. Can any reader give me from recent experience particulars of buildings in that city worth sketching and photographing, and what facilities exist for getting into these edifices? I don't want hashed guides, but personal tips from some recent open-eyed visitor, and in time for my holidays beginning on Saturday week.—PENCIL POINT.

REPLIES.

[12000.]—Supporting Tank.—900 gallons equals $\times 10\text{lb.}$ per gallon, 9,000 gallons, or a little over 4 tons in weight, plus the weight of tank. "Notes on Building Construction," Part 4, of Longmans and Co., in Table 1a, on "Safe Resistances of Materials." I take the section on compression. Brickwork, stock, 0.8wt. per square inch; brickwork, cement, 0.8wt. per square inch; brickwork, cement (3), 0.8wt. per square inch. So perhaps you can work this out from these data. B. T. Batsford, High Holborn, stocks.—REGENT'S PARK.

LEGAL INTELLIGENCE.

IN RE A. BARNETT, OF WELLINGTON, SALOP.—A statement of affairs has been issued as to the position of Andrew Burnett, architect and surveyor, of Wrekin-road, Wellington, Salop, who underwent his public examination at Madeley Bankruptcy Court on Wednesday last. The liabilities shown are £356 17s. 2d., and the assets are put at £2 19s., leaving a deficiency of £353 18s. 2d. The cause of failure alleged by the debtor is that his income was insufficient to pay household and personal expenses. From the Official Receiver's observations it appears that debtor has been in practice on his own account at Wellington for the past three years. Previously he was employed as an assistant with a firm of architects in Wellington, and before that in a similar capacity in Birmingham. There are practically no assets disclosed in the statement of affairs, part of the furniture at the debtor's house in Wrekin-road being hired, and the remainder is claimed by his wife, as having been purchased out of her separate income. Of the total unsecured liabilities, £145 represents money lent, and the balance is owing to sixty tradespeople in Wellington and various places, in respect of household and personal accounts, mostly incurred during the present year.

The committee formed to consider the erection of a memorial to the Warwickshire soldiers who fell in the South African war met at the Shire Hall, Warwick, on Saturday afternoon, Lord Leigh presiding. It was decided that the memorial should take the form of a marble tablet in St. Mary's Church, Warwick, on which the names of the men of the Warwickshire regiment who lost their lives in South Africa should appear, and that Mr. Albert Toft should be asked to submit a design for the tablet, he being informed that the whole funds available are £300.

At Saturday's meeting of the Metropolitan Asylums Board the works committee reported that the whole of the buildings comprised in Messrs. Leslie and Co.'s second contract for the erection of the Joyce-green Hospital had been handed over, some on June 23 and the remainder on July 27. The committee had approved the action taken by the chairman of the committee, Mr. J. T. Helby, in having authorised the engineer to the Board to carry out works with a view to remedying serious defects in the fire alarm system of the Park Hospital, at a total cost of about £80. The committee recommended that the tender of Messrs. Charles B. Roberts and Co., of Redhill, be accepted for the execution, at the cost of £12,950, of fire-resisting works, alterations, and additions at the Fountain Hospital, in accordance with the plans and specifications prepared by Messrs. T. W. Alwinckle and Son, architects. This recommendation was adopted.

The isolation hospital, Ticehurst, Sussex, is being warmed and ventilated by means of Shorland's patent Manchester grates and exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Cape to Cairo Railway is now making rapid progress northwards from the Cap. The line has been carried forward by the Chartered Company to the Waukie Coalfields, which are 200 miles north of Bulawayo and some 70 miles south of the Victoria Falls.

WATER SUPPLY AND SANITARY MATTERS.

ARBOATH.—The town council have adopted the recommendation of the committee on water supply to draw upon the waters of the Niran, a stream twenty-one miles north-west of the town, which is estimated to be capable of supplying 4,000,000 gals. per diem. Piping will be laid to convey over 1,000,000 gals. daily to Arbroath. The total cost is estimated at about £30,000. The present supply is an underground one, which will be retained until this new gravitation supply is brought to the town. Messrs. Crouch and Hogg, engineers, Glasgow, have been instructed to make a survey of the ground, and bring up a report.

LYNDHURST.—The rural district council have unanimously accepted the tender of Mr. Samuel Wood, of Bristol, for £8,839, to carry out the scheme of sewerage and sewage disposal prepared by their engineers, Messrs. Combes, W. B. G. Bennett, Son, and Berry, of Midland Bank Chambers, Southampton. The work includes the sewerage of Lyndhurst with Emery Down and Bank, and the disposal of the sewage at Fox Hill and Bank. Considerable care had to be exercised in the designing of the disposal works, as the effluent has to be discharged into the Forest streams. A joint inquiry was held by the Local Government Board and the Woods and Forests Commissioners before their sanction was given. It was decided to install at both sites duplicate detritus chambers and open bacterial tanks, and circular percolating beds with automatic revolving sprinklers. These works require but little fall, and will cost about £1,100. The tenders, of which there were nineteen, came well under the engineers' estimate, which was £10,000.

CHIPS.

Lord Armstrong laid at Walsend, yesterday (Thursday) afternoon, the foundation-stone of the Victoria Memorial Parish Hall, in connection with St. Peter's Church. The new building will serve as a parochial hall, Sunday-school, mission-room, and reading and recreation-room. It will cost £2,500, exclusive of furnishings, and occupies a site at the corner of Durham-street and Charlotte-street.

The members of the Peterhead Master Builders' Association have elected the following officers for the forthcoming year:—President, Mr. William Hadden; vice-president, Mr. John Davidson; secretary and treasurer, Mr. A. Clark-Martin.

Estate of the gross value of £44,432, including net personality £13,674, has been left by the late Mr. Herbert Dornier, civil engineer, late of Manchester, who died at Harrogate on July 10.

The sales at the Mart, Tokenhouse-yard, last week, as registered at the Estate Exchange, amounted to £5,805, and for the corresponding week of last year to £8,840.

At the last meeting of the South Stoneham Board of Guardians it was decided to carry out works of fire protection and provision for escape at the workhouse at Westend, in accordance with plans prepared by their architect, Mr. Mitchell, of Southampton, and subject to the approval of the Local Government Board. The estimated cost is £750.

The parks committee of the Bradford City Council have decided to purchase six acres of land in Snakehill-lane, from the Illingworth family, for the purposes of a public park for Gillington.

The ceremony of laying the memorial stone of the Sutherland Technical School was performed at Golsie on Tuesday by Lord Balfour of Burleigh, Secretary for Scotland. Donations to the building fund have been made of £5,000 each from the Duke of Sutherland and Mr. Carnegie. Instruction will be given in building construction, manual training in woodwork and metal-work, drawing, carving, design, modelling, and other subjects.

The internal alterations at the City Temple, Holborn Viaduct, just completed, have included the removal of Dr. Parker's rostrum below the pulpit, new ventilating and heating apparatus, and the substitution of the electric light for gas. The outlay has been over £6,000.

At Tuesday's meeting of the Berwick Town Council it was announced that the Local Government Board had authorised the borrowing of £1,445 for improvement works at the seaside resort of Spittal. The council will take steps to purchase old cannon from the War Office for the adornment of the ramparts. Berwick streets will be lighted by electricity in the middle of October.

A largely-attended and influential meeting of clergy and laity was yesterday held at the Royal Pavilion, Brighton, to consider the provision of a memorial to the late Archdeacon Mount. It was decided to erect a memorial in Chichester Cathedral, and a committee was appointed to determine the form it should take.

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ILLUSTRATIONS.

THE "CHURCH TIMES" AND GEORGE BELL AND SON'S NEW OFFICES, PORTUGAL STREET, W.C.—WYKEHAM HATCH, BYFLEET.—DESIGN FOR A LONDON STREET FRONT.—ENTRANCE TO A HOUSE AT HAMPSHIRE.—NEW OFFICE PREMISES, NOTTINGHAM.—PROPOSED FLATS AT SHEPHERD'S BUSH.—BRACELEY COTTAGE, CAMPDEN HILL PLACE, W.—BEACON TOWER, CORTACHY, N.B.—YORK CITY ASYLUM.

Our Illustrations.

NEW PREMISES FOR THE "CHURCH TIMES" AND GEO. BELL AND SONS, PORTUGAL STREET, W.C.

THESE buildings are now being erected in Portugal-street, W.C., for the *Church Times* and Messrs. Geo. Bell and sons (publishers). They are being faced in red bricks, with somewhat lighter bricks for the dressings. Portland stone has been used for some of the work, but this has been sparingly done to avoid expense. The cornice is cement painted white. The builders are Messrs. Chisholm and Co., Kensall-green. The architect is Mr. Horace Field. The drawing which we give was exhibited at this year's Royal Academy.

WYKEHAM HATCH, BYFLEET.

THIS Surrey house in brick with stone sparingly used is from the designs of Mr. F. Steward Taylor, architect. The gables, treated after the form of Georgian pediments, are plastered, and a feature is made of the entrance with its Ionic columns. The walling is in red facings.

DESIGN FOR A STREET FRONT.

THE ground floor is occupied by a restaurant approached by a door on the left of two elevations. The first floor contains offices, the remaining floors workshops, &c. These are approached by the door on the right. The front is treated with red facing bricks and Portland stone. The woodwork in shop-front and window-frames is oak. Mr. Amian L. Champneys, B.A., is the architect. The drawing appeared at the Royal Academy this summer.

ENTRANCE TO A HOUSE AT HAMPSHIRE.

THE illustration shows the treatment of decoration applied to the entrance-hall of a house at Hampshire, and includes a new staircase, vestibule screen, and the walls lined with pine framing, all finished white. Above the framing is a stencilled decorated frieze in four colours. The ceiling is panelled out with broad flat ribs and new cornice, the former decorated with slight stencillings in red and grey. The newel lamp is in wrought iron. The drawing in water colour was hung in the 1902 Royal Academy Exhibition, and the architect is Mr. Arthur H. Moore, A.R.I.B.A., of Bedford-row, W.C.

NEW OFFICE PREMISES, NOTTINGHAM.

THE premises shown, situated at 41, Parliament-street, Nottingham, are offices with shops under erected, by the architects, Messrs. Brewill and Baily, for their own use, on the site of the Old Sun House. The ground story is constructed of black granite with stone frieze and cornice, and

the upper part of small red sand bricks, with stone quoins. The window-frames and main cornice being of wood, painted white, and the windows are all fitted with iron casements and lead lights. The entrance porch is panelled with oak, and the hall with painted pine in large Georgian panels, and paved with squares of black and white marble. The principal rooms on the first floor also are panelled in various periods. The main staircase is of oak, and the floors are of wood block throughout. The work has been carried out by Mr. W. Appleby, contractor, of Lenton Boulevard, Nottingham.

PROPOSED FLATS, SHEPHERD'S BUSH.

THESE flats were proposed to be built on a site facing Shepherd's Bush-green. The materials would be red brick facings for the walls, with Portland stone dressings round the entrances. The roofs would be covered with green Westmoreland slates, and the joinery to verges, eaves, and windows would be painted white. The architects are Messrs. Clarke and Warwick, of Lancaster-road, W. The drawing reproduced was shown at the Royal Academy this year.

BRACELEY COTTAGE, CAMPDEN HILL PLACE, W.

THE illustration of the above shows the new wing lately erected. Externally the walls are finished in roughcast, except plinth to angle bay window, this plinth being in yellow stock bricks. The roof is slated to match present work. The contract was let to Messrs. B. Colley and Sons, Portland-road, Notting Hill. The architect is Mr. W. H. Raiffes, Gray's Inn-square, W.C.

BEACON TOWER, CORTACHY, N.B.

THIS tower has been erected as a memorial to the late Earl of Airlie, who was killed in action at Diamond Hill, near Pretoria. It is 70ft. high, occupies a site on Tulla Hill 1,230ft. above sea level, and is arranged as a beacon tower, to be used on occasions of estate or national rejoicings. The whole is built in rock-faced local red sandstone, the base being relieved with carved panels of the Airlie arms and the badges of the regiments in which the late Earl served—viz., Scots Guards, 10th Hussars, 12th Lancers, "The Bays," and Hants Yeomanry. The work has been carried out from designs prepared by Mr. T. Martin Cappon, F.R.I.B.A., selected in competition.

YORK CITY ASYLUM.

(For description see p. 337).

CHIPS.

THE willy imaginative report published by the Daily Press at the beginning of the week to the effect that an American syndicate contemplated buying up the Bull Clay Mines in Devonshire and Dorsetshire, upon which the pottery industry depends, is obviously without foundation. Inquiries of leading manufacturers show that no offer has even been made, and that it is impossible for Americans to buy up these mines, as all the property mined is entailed.

THE inhabitants of Aysgarth are going to have presented to them a fine Cambridge quarter-chime clock, showing the time upon two large external dials, to be fixed in the tower of their parish church. The clock and chiming will be from the designs of Lord Grimthorpe, and be made and fixed by Messrs. W. Potts and Son, clock manufacturers, Leeds and Newcastle-on-Tyne, makers of the church clocks in the adjoining church towers of Askrigg, Weusley, Leyburn, and Middleham.

THE most important of the Roman relics discovered at Brough, near Hope, have been received by the Buxton town authority, and placed in the museum at the town-hall. They include Roman altars, a circular trough, and a slab with inscriptions. The Roman milestone discovered some years ago at Buxton, which has been in the possession of the museum authorities at Derby, has been handed over to the place from which it originated, and was received at the Buxton Town Hall last Friday.

THE Y.M.C.A. Institute at Lanark, which has just been erected at a cost of over £2,000, was formally opened on Friday.

IN compliance with a strong expressional feeling of the City Council of Liverpool at their last meeting, the recommendation of the Finance Committee that Mr. T. Stirling Lee be engaged to execute twelve figures above the panels on the front side of St. George's Hall, being part of the scheme of sculpture for the completion of the building, was withdrawn.

George Spiers Kenneth, architect, Glasgow, died in Glasgow Infirmary, on Sunday, from injuries received in the railway accident at St. Enoch Station in July last. Mr. Kenneth was only 29 years of age.

STATUES, MEMORIALS, &c.

QUEEN VICTORIA MEMORIAL.—Some 300 excavators are now at work on the southern side of the Mall and the ornamental lake in St. James's Park. The contractors have been staking-out the ground from the drawings of the surveyors of H.M. Office of Works. The work, for which Mr. Aston Webb, R.A., is the architect, is of an extensive character, including the construction of new roadways, the diversion of present thoroughfares, the damming of three-quarters of an acre of the lake, tree-cutting, and elevating the level of the lake-bed to that of the Mall (about 40ft.). The monument of Queen Victoria, designed by Mr. Brock, R.A., will be erected in the centre of the segment of a circle, now indicated by a wooden post distant about sixty yards from the central gateway of Buckingham Palace, and around it will be grouped allegorical figures representing the extent and power of the empire. Three new avenues will sweep from the Mall, at a point near Stafford House, by the memorial, one leading to Constitution Hill, a second into the grand thoroughfare in front of the Palace, and the third curving to the left and striking Birdcage-walk at right angles near the guard-room of Wellington Barracks. In place of the old pathway round the lake there will be a colonnade of Portland stone with suitable sculptures, the first block having been already erected.

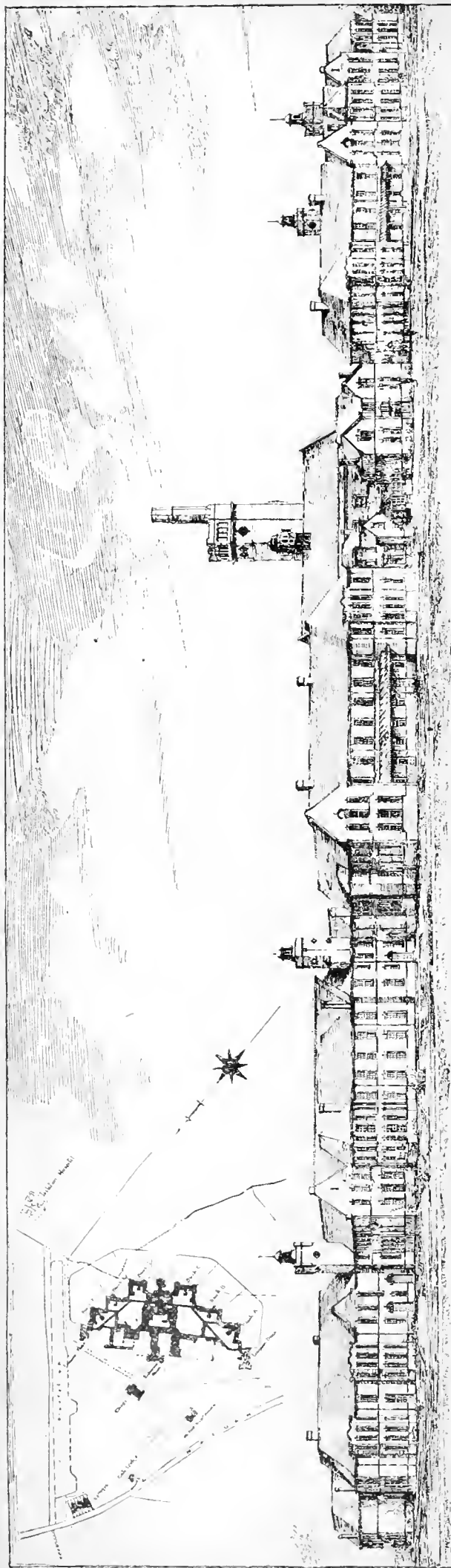
LEEDS.—The scheme for the adorning of the City-square with statuary is now fast approaching completion. The bronze equestrian statue of the Black Prince, by Mr. T. Brock, R.A., is being placed in position. Round this central figure—the gift of Colonel Harding—are already grouped other and smaller bronze statues of John Harrison, a Leeds benefactor of the 16th century; Dean Hook, the great vicar of Leeds; Joseph Priestley, the discoverer of oxygen, who at one time was the pastor of Mill-hill Unitarian Chapel, close by the Square; and James Watt, the inventor of the modern condensing steam engine. The statue of Priestley is by Mr. Alfred Drury, and those of John Harrison and James Watt by Mr. H. C. Fehr, whilst that of the Dean of Chichester is the work of Mr. F. W. Pomeroy. In addition there are four pairs of nude female figures in bronze, by Mr. Drury, representing "Night" and "Morning." These serve as electric light standards, and there are also large lamps rising from figured bases in bronze representing groups of children.

WORCESTER: SOUTH AFRICAN WAR MEMORIAL.—A meeting of the committee entrusted with the provision of a memorial in honour of Worcester-shire men who fell in the South African war was held on Saturday at the Shire Hall, Worcester, the Earl of Coventry presiding. The question of the form of memorial was placed before the committee on the report of a special sub-committee that Mr. Thomas Brock, R.A., was unable to undertake the design and execution of a memorial, and suggested that he should be entrusted with the provision of a replica of his Ayr memorial. The Mayor of Worcester wrote urging that the memorial should be of original design. Viscount Cobham sympathised with this view, and proposed that original designs be invited from sculptors. He was opposed to a replica, and he thought the design in this case was not suitable for the proposed site in the cathedral churchyard. The resolution was seconded and carried. Lord Coventry and Lord Hampton were also authorised to interview Mr. Coulton, who was recommended by Mr. Brock to be entrusted with an original design. It was reported that £1,300 would be available when all expenses were paid.

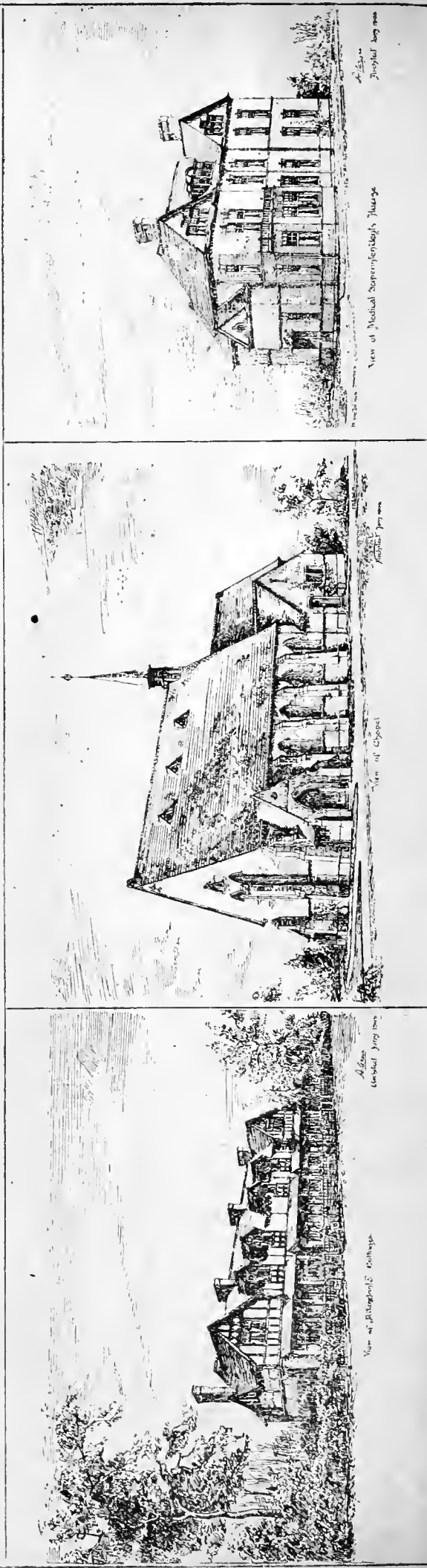
APART from the baths in connection with some of the Board schools, there are at present in Bradford only two swimming-baths—those at Manchester-road and Thornton-road. Other baths at Morley-street and Drummond-road are, however, in course of erection, and a Local Government Board inquiry was held at the Bradford Town Hall on Friday, before Colonel W. L. Cole, for the purpose of receiving sanction to borrow £22,500 for the erection of three district baths. It is proposed to erect these, one near Bowling Church in Wakefield-road, to cost £7,911; another in Leeds-road near to Holy Trinity Church, on which £7,796 will be expended; and a third in a corner of Peel Park, at an estimated outlay of £8,362.

AT a meeting of the finance committee of the Newcastle-on-Tyne Corporation on Monday, it was reported that the total amount paid for tramway construction was £962,000. Of this sum, £87,000 had been borrowed. Application was being made to the Local Government Board for power to borrow an additional £128,000 for tramway purposes and street improvements. The town clerk was instructed to press this matter forward, that the amount required may be obtained.

AT Springfontein Station, South Africa, £20,000 is being spent in improving the accommodation, the work including the lengthening of the platform, the erection of a new goods shed, and the provision of offices.



Ward Blocks - View from the South

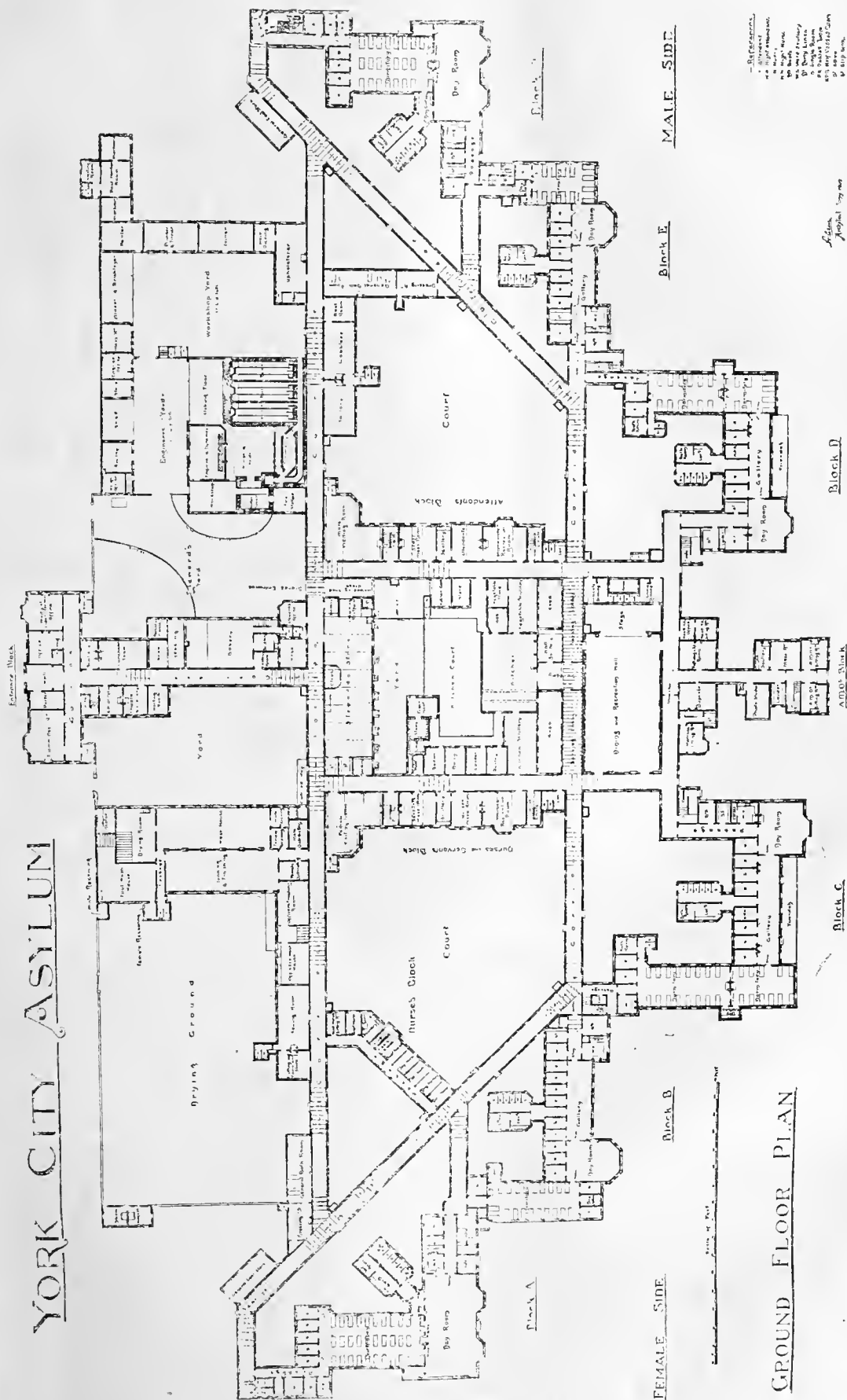


YORK CITY ASYLUM.

BRACELEY COTTAGE CAMPDEN HILL PLACE - W. W. HARGRAVE RAFFLES ARCHT

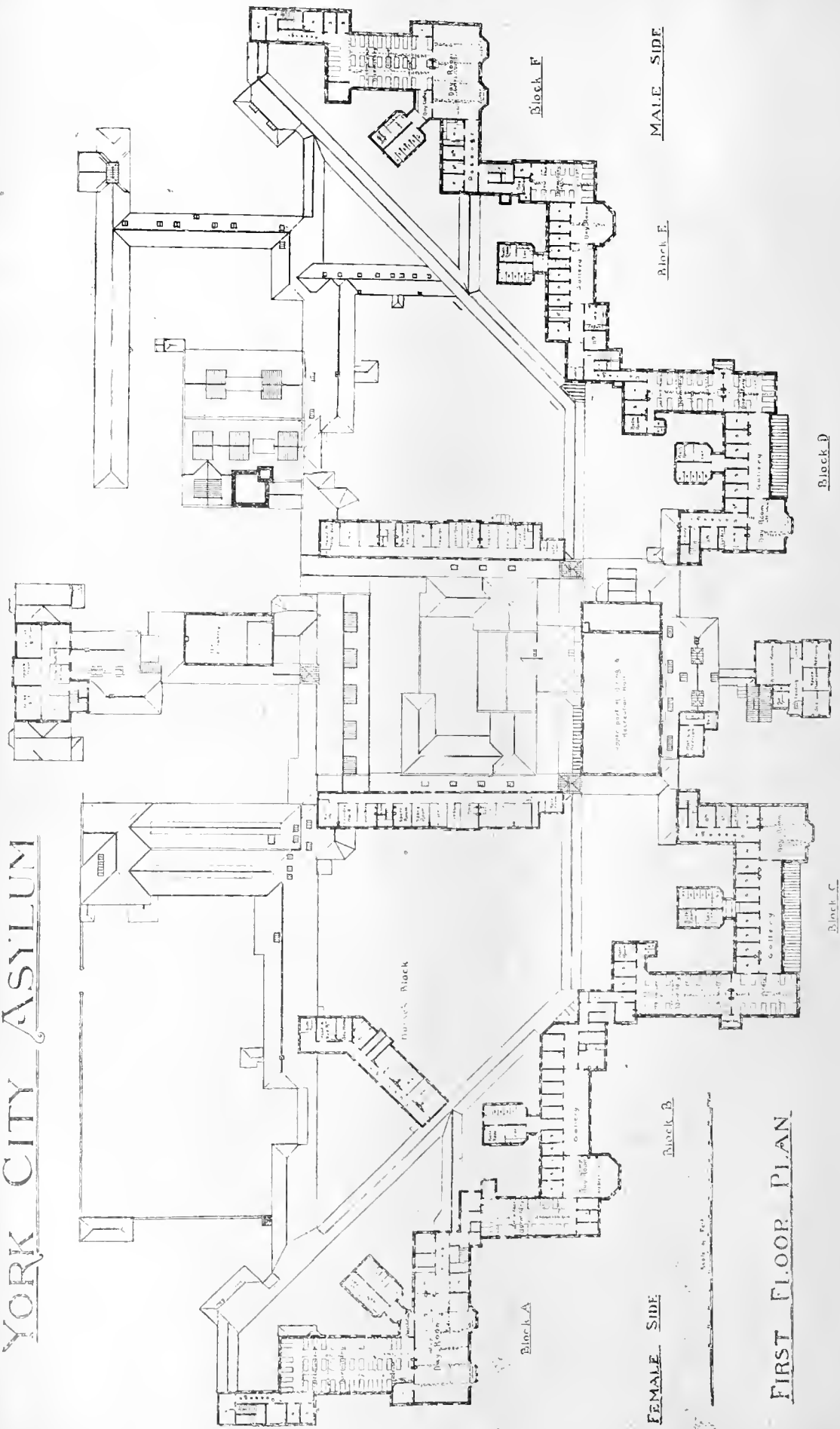


YORK CITY ASYLUM



GROUND FLOOR PLAN

YORK CITY ASYLUM



Our Office Table.

THE thirty-third autumn exhibition at the Walker's Art Gallery, Liverpool, opened this week, includes over 1,200 paintings and drawings, besides miniatures, examples of sculpture, and work in black and white. Portraits predominate this year, the chief exhibitors in this branch being Sargent, Herkomer, Watts, Oulless, Reid, Fildes, and Lavery. The Hon. John Collier shows his "Prodigal Daughter," a feature of the recent Academy, and among other *genre* works are Stanhope Forbes's "Nomads," Clansen's "Hay-makers," Boughton's "Imogene," and J. W. Waterhouse's "Echo and Narcissus." Poynter and Alma Tadema are also represented by recent works. Among the landscapes are examples of work by Parsons, Murray, La Thangue, and an interesting canvas by G. F. Watts, as well as several by the modern Dutch school, including Israels, Manve, and Maris.

THE autumn exhibition at the Manchester City Art Gallery, which opened on Monday, is not equal to some former displays, and the pictures are manifestly cramped for space in the present building. The chief attractions are Sir E. J. Poynter's "Cave of the Storm Nymphs" and Edwin Abbey's "Crusaders Sighting Jerusalem." Other works of interest are Sir W. B. Richmond's "Phaeton Sunrise," Sir E. A. Waterlow's "Warkworth Castle," Alfred East's "Château Gaillard," and J. C. Dollman's clever illustration of Kipling's story of the boy elected king of the monkeys, and Sir Wyke-Bailliss's "Louvain Cathedral." Among the landscapes those by Clarence White, Coutts Mitche, A. Roche, D. T. Cameron, Joseph Farquhar, and Adrian Stokes deserve a passing line, while portraiture is well represented by the works of Charles Furse, Ralph Peacock, G. H. Boughton, and Monat Loudan.

In a letter to the *Standard*, Mr. Harry Hems corrects the error into which Mr. A. J. Waterfield had fallen in a previous communication to that journal in supposing the grand series of groups (40 in number) illustrating the life of the Blessed Virgin, that run continuously around the screen inclosing the choir of this superb cathedral from its aisles, are actually carved "point lace like in stone." "This," Mr. Hems explains, "is not a fact. The first one (at the west end of the south aisle) represents a group of shepherds, with bagpipes and attendant goats, and the story ultimately finishes with the Virgin, after death, crowned as Queen of Heaven. Thus the whole life of our Lord, from his mysterious incarnation to his death and resurrection, is incorporated therein. Every figure (although, like so many French ones, short in stature) is powerfully conceived, but—and of this few are aware—so far from being part and parcel of the fabric, these groups are simply plaster of Paris casts of the sculptor's original clay models. The actual work in stone has never yet been carried out. It must be fully forty years ago that, when examining them from the top of high trestles, I made this discovery. It is also not generally known that when, many years ago, the west front, with its great rose window between the towers, got somewhat out of perpendicular, and thus suggested possible danger, a French engineer got it upright again by a clever expedient. Long iron bars were made to connect the masonry of the front to portions of the inner roof. These rods were continually heated red hot in places, and then allowed to cool. Thus the natural shrinkage of the metal materially lessened its length, and the wall was pulled up again plumb."

A CONTEMPORARY summary of the clauses of the notorious Window Tax, introduced just a century ago, is given by the *Leeds Mercury*, as one of a series of extracts from the early issues of that journal. The following excerpt, dated Sept. 3, 1803, is suggestive, as showing how restrictive on enterprise and injurious to health this ill-judged impost was in its practical operation. "According to new rules for charging the window duties, skylights, cellar lights, staircase or passage lights are all to be included. Whether the kitchen, cellar, washhouse, brewhouse, &c., shall be within the dwelling, contiguous to or disjoined from the same, shall be equally liable as if a part of the house. When a division between two or more windows is more than 12in. broad, the light on each side shall be charged as a separate window. Window giving light to more than one room or landing-place shall be

charged as so many distinct windows as the number of places it gives light to. All windows exceeding 1ft. high or 1ft. 6in. broad, including the whole opening of the wall in which the window is fixed, shall be charged as two windows, unless built prior to April 5, 1785; excepting also the windows of shops, workshops, or warehouses, and those belonging to places of public entertainment, licensed to sell wine or other liquors, and excepting farmhouses."

THE new session of the Birmingham Central Municipal School of Art will begin on Monday next the 14th inst., when the newly-appointed headmaster, Mr. R. Catterson-Smith, who has succeeded Mr. Edward K. Taylor, will commence his duties. Interesting syllabi have been prepared by Messrs. W. H. Bidlake, M.A., A.R.I.B.A., C. E. Bateman, F.R.I.B.A., Herbert T. Buckland, and others in connection with the classes in architectural history, architectural design, taking builders' quantities, building construction, and geometry. The main object of the school is to make artisans better workmen. Whilst fulfilling that object, every facility is provided for students who wish to learn drawing, painting, or modelling, solely on educational grounds, for teachers in schools, and for students who possess an aptitude for a craft and wish to develop it.

THE prospectus of the City of Liverpool School of Architecture and Applied Art for the session 1903-4 shows that the school now consists of—(1) Architectural studio, (2) sculpture and modelling studio, (3) drawing and painting studio, (4) decorative design, stained glass, and enamelling studios, (5) metal-working workshop, and (6) woodcarving workshop. Both day and evening classes are held, the objects being—(1) To effect a complete union between the different arts and crafts, (2) to establish a thorough course of training for students in the different arts, especially in architecture, sculpture, and decorative design, and (3) to provide special instruction of an advanced kind for skilled craftsmen and artisans, chiefly in those crafts allied to architecture.

THE Ecclesiastical, Educational, and Art Exhibition will celebrate at Bristol its "silver" anniversary, the first being at Swansea in 1879. Mr. Hart's 25th exhibition will be held at the Rifle Drill Hall, Queen's-road, Bristol, concurrently with the Church Congress. The loan collection will be one of the best that has been seen for some years. Besides the Bishop and the Lord Mayor, Mr. Hart has secured on the committee for this section the Duke of Beaufort, the Dean of Bristol, Sir John Dickson-Poynder, M.P., Colonel T. W. Chester-Master, and the Rev. H. R. Wilkins, hon. secretary. Among the promised exhibitors are the Bishop, the Dean and Chapter, and the Lord Mayor and Corporation—the latter sending not only the valuable plate of which they are the custodians, but also some of their city's ancient records.

AN exhibition of Building Improvements and Decorative Art is to be held in the Aquarium at Brighton, now the property of the corporation of that borough, from Wednesday, the 23rd inst. until October 10. The committee propose to organise an exhibition of all novel and attractive patents in the building world, giving due prominence to artistic, decorative, and modern improvements, rather than to ordinary and staple articles of utility long since recognised. At the same time exhibits of historical interest and those illustrative of the progress of British architecture will be welcomed. The exhibits will include decorative metal-work; art wall decorations and enrichments; the best appliances for lighting, sanitation, ventilation, and fireproof construction; mechanically ornamented woodwork; improvements in glazing and roofing. Artistic household fixtures and fittings will receive special attention. The corporation of Brighton have recently applied to the Local Government Board for permission to expend a considerable sum in enlarging the Aquarium itself, and several large building contracts have recently been placed, and others are shortly to be tendered for in the town; important public works are also in course of arrangement at Worthing, Hove, Shoreham, and other closely neighbouring towns. The exhibition, therefore, is being held at a period peculiarly suitable for the prominent display of all that is valuable in modern building design, construction, and decoration. The Aquarium Committee, having decided to introduce a new heating system in the buildings, offer a special prize of 20 guineas for the best proposal, to be accompanied by plans and

estimates, with or without illustrative working models, the cost not to exceed £600. The organising manager is Mr. Ed. S. Michel, Grand Aquarium, Brighton.

COUNCILLOR JAMES HIGSON, J.P., of Salford, has been nominated by the council of the National Association of Master House Painters and Decorators of England and Wales (Incorporated) for the position of President for 1903-4, and it is probable that the convention next year will be held at Manchester. It will be then exactly ten years since the association visited the city, the last occasion being at the time of its inauguration in 1894. It will come to Manchester next year a strong and representative body, as its constituents cover the whole of England and Wales. Amongst its five life members are Mr. Walter Crane and Mr. George Haire, two are American citizens, and one an eminent Scotch decorator. The tenth annual convention meets at Nottingham on the 21st inst., and Lord Henry Bentinck, M.P., is to open the proceedings.

TENSILE tests of wrought-iron bars, showing the effect of overstraining followed by intervals of rest, were made at the Watertown Arsenal upon four kinds of wrought iron: Common, refined, best puddled, Burden's best, and Norway. One test on each kind was made in the ordinary manner. With the other specimens an overstraining load was applied, ranging from 25,000 to 45,000lb. per square inch, followed by an interval of no load, after which the loading was resumed until rupture was reached. The gain in the elastic limit produced by the overstraining loads was well shown throughout the series, and ranged from 2,000 to 6,000lb. per square inch. It was also apparently shown, although these effects are not so well marked, that the greater the magnitude of the overstraining load and the longer the interval of rest between the two loadings, the greater was the gain in the elastic limit. No effect of the overstraining load upon the contraction of area was apparent.

ON September 1, on the Nottingham Forest Football Club's ground, a fire test of "Uralite" was carried out in the presence of a large number of architects, builders, corporation officials, the fire brigade, and other gentlemen. A screen was erected consisting of ordinary timber covered with "Uralite," and against this a huge bonfire was lighted made of timber soaked in petroleum. In the middle of the bonfire a deed-box was placed, constructed of timber covered with "Uralite," and inside the box were placed a quantity of papers, sulphur, paraffin-wax, and fusible metal. After the fire had burned itself out the box was opened (the temperature to which it had been subject was at times as high as 1,800° Fahr.), and it was found that the contents were uninjured, and the inside of the box was not even warm to the hand. The back of the screen never reached more than a few degrees above the normal temperature of the atmosphere. All present expressed themselves pleased with the results of the test. The material has already been adopted by 100 different trades for a great variety of purposes, notably in connection with electric railway carriages for covering the underside as a protection against fire caused by short circuits, for railway panels, for roofs of all kinds of buildings, for ceilings, partitions, and doors in factories and workshops. Messrs. H. Hopkinson, Ltd., iron, steel, and metal merchants, of Station-street, Nottingham, are the agents for the city and county of Nottingham, and were represented on the field by Mr. Hopkinson and his sons. The representatives of the British Uralite Co. present were Mr. Armstrong, commercial manager, Mr. Watson, works manager, and Mr. Smith, assistant City manager.

A COLOSSAL Calvary of oak, which formerly stood on the coast near Du Conquet, Finisterre, and has for many years past been a prominent feature in the garden of Mr. Harry Hems, in Fair Park, Longbrook-street, Exeter, has been set up in the highest part of the Abbey garden at the Benedictine Monastery, Erdington, near Birmingham. It is about 10ft. in height, the figure of Our Saviour being over 8ft. high. The crucifix has evoked some criticism and hostility on the part of ultra-Protestants at Erdington, who, apparently, cannot accord to their neighbours that liberty of conscience they claim for themselves, and to allay local feeling the Fathers have planted the site round with trees, which will, ere long, partially screen this massive and excellent example of the 16th-century art of Brittany.

THE City Corporation will shortly offer for

annual competition among the members of the private fire brigades of the Metropolis a handsome challenge shield, the members of the winning team receiving medals. The majority of the great firms in London possess their own fire brigades, and in the City some excellent work has been from time to time performed by these amateur firemen. For the purpose of encouraging the movement the Corporation has contributed the challenge shield, which bears on the top the arms of the City of London, flanked by firemen's helmets, and encircled by laurels, while the centre-piece illustrates firemen at work. The shield is surrounded by a number of tablets, upon which will be inscribed from time to time the names of the winning teams. On the reassembling of the Court of Common Council arrangements will be made for the competition.

The city council of Manchester have, by a unanimous vote, authorised the tramways committee to act under the provisions of the Manchester Southern Tramways Act, 1903, so far as they affect the corporation, and to take such action and enter into such arrangements as they may deem advisable. In the last session of Parliament the Manchester Southern Tramways Bill, which was supported by the corporation, after being passed, became practically the Act of the corporation. It provides that tramways are to be constructed from Barton Bridge, along Crofts Bank-road, by Davyhulme and Urnston, to Stretford, along School-road and Northenden-road, Sale, past the Industrial Schools, and on through Northenden, and to connect with the tramways of the Stockport Corporation at Gatley. In that way there will be formed a complete ring of tramways round the city on its southern side. There is also to be an extension along the main road from the Old Cock Inn, Stretford, to the boundary of Altrincham, with which town Manchester will enjoy through communication, under an arrangement to be concluded with the Altrincham District Council. Manchester will thus be provided with tramway connections along all the main roads with the surrounding towns. From Northenden there will be connections with Stockport, Denton, and Ashton. Manchester is already connected with Middleton, and they have made overtures to the Oldham Corporation for the running of through cars to that town.

THE ARCHITECTURAL ASSOCIATION.

COURSES OF INSTRUCTION IN ARCHITECTURE.
The Day School will open on MONDAY, September 22nd, at 9.45 a.m. Intending pupils are requested to forward their names to the Secretary as early as possible.
The Evening School also opens on the same date at 6.30 p.m.
A pamphlet containing full information as to the Classes and advantages of membership may be obtained upon application to the Secretary, at 55, Great Marlborough Street, London, W.
H. P. G. MATELLE, Secy.
H. TANNER, Jun., Hon. Secs.

The Society of Architects.

Founded 1884. Incorporated 1893.

The next ENTRANCE EXAMINATION will be held in LONDON and certain PROVINCIAL CENTRES on OCTOBER 6th, 7th, and 8th, 1903. Syllabus post free, or on application to the SECRETARY of the Society of Architects, St. James's Hall, Piccadilly, London, W.

The will of Mr. Killingworth Richard Hedges, of 51, Montagu-square, who died on July 10, was proved on August 21, by Assheton Pownall, Alexander Martin Bremner, Herbert Alexander Wix, and Charles Bourne-Royds, the executors, the value of the estate being £34,156.

A prehistoric British barrow was opened at Martinstown, Dorset, on Wednesday, under the supervision of Mr. St. George Gray, curator of the Taunton Museum. There were disclosed worked flints and several interments. In the centre of the barrow was found a large British urn inverted on a slab of stone, covering some cremated remains which had been wrapped in a rough material of cloth or rushes, the texture of the weaving being still traceable. A quantity of other pottery was also unearthed. In another barrow close by have been found a vase and a bronze knife with a portion of a willow handle.

At the last meeting of the Public Libraries Committee of the Barry Urban District Council, a letter was read from Mr. Andrew Carnegie declining to contribute an additional amount towards the cost of the proposed central library and reading-room at Barry. The committee had a consultation with Messrs. Hutchinsons and Payne, of London, the architects, and reductions in the estimates were decided upon in order to bring the cost of the building within the amount of £8,000, which Mr. Carnegie has given.

Trade News.

WAGES MOVEMENTS.

BURSLER.—Messrs. Doulton, Ltd., have given notice to the sanitary potters at their Burslem works to terminate their contracts, with a view to a reduction in the prices paid for certain articles. The operatives have given a counter notice asking for an increase in the prices paid for some other articles. Messrs. Doulton offered to submit the whole matter to arbitration, but the operatives have passed a resolution not to submit to any reduction, and not to accept arbitration.

LIMERICK.—A dispute among bricklayers and masons has resulted in a lockout in Limerick. The cessation of work means a loss of £300 per week to the working men of that city. The quarrel had its origin in the refusal of the masons to work with bricklayers from Belfast who were employed by Messrs. Ryan and Son, when the Guild of Masons failed to provide the number of men which they undertook to secure for the employers, who are contractors for the building of a new Post-office and a training college for girls in that city. The guild agreed that Messrs. Ryan should advertise for "brickmen," but when the men arrived they did not work, as the masons held that they had given permission to employ outside "brick and stone men," a distinction which, it is said, is not understood outside of Limerick.

SUNDERLAND.—The Sunderland joiners have held a mass meeting in the Villiers-street Institute for the purpose of considering the dispute which at present exists between the house joiners and the masters. Nearly three months ago the men came out on strike for an increase of 3d. per hour, which would bring the rate up to 10s. per hour. Attempts to effect a settlement failed, the men refusing to accept the suggestion of his worship the mayor. The last proposal of his worship was that an arbitrator should be appointed; but on a ballot the men refused to accept this by a majority of over 100. The masters then decided upon a lock-out over the area of the Northern Counties federation, but agreed, at the request of the men's representatives, to postpone the lock-out for a fortnight, in order that a ballot of the men might be taken on the question of arbitration. At a meeting on Friday, which was largely attended by both shipyard and house joiners, this ballot was taken, and it was agreed by a small majority to submit to arbitration. The men also decided not to resume work until the award is made known.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English.....	6 10 0 "	6 12 6
Wrought-Iron Order Plates.....	7 0 0 "	7 5 0
Bar Iron, good Staffs.....	8 5 0 "	8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0 "	20 0 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0 "	8 15 0
Best Suedhill.....	9 10 0 "	9 10 0
Angles 10s., Tees 20s. per ton extra.		

Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.
Builders' Hoop Iron, galvanised, £12 to £13 per ton.

Galvanised Corrugated Sheet Iron—

ft. to ft. long, inclusive	No. 18 to 20.	No. 22 to 24.
gauge.....	Per ton.	Per ton.
Best ditto.....	£11 15 0	£12 0 0
	12 5 0	12 10 0
Cast-Iron Columns.....	Per ton.	Per ton.
Cast-Iron Stanchions.....	£6 10 0 to	£9 10 0
Rolled-Iron Fencing Wire.....	8 0 0 "	8 5 0
Rolled-Steel Fencing Wire.....	6 5 0 "	6 10 0
" " Galvanised.....	7 15 0 "	8 0 0
Cast-Iron Sash Weights.....	4 12 8 "	4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0 "	9 5 0
Cut Floor Brads.....	9 0 0 "	9 0 0

Wire Nails (Points de Paris)—

6 to 7	8	9	10	11	12	13	14	15	B.W.O.
8-	8 6	9 6	9 9	10 6	11 3	12-	13-	13-	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£5 15 0 to	£6 0 0
4in. to 6in.....	5 12 6 "	5 17 6
7in. to 24in. (all sizes).....	5 7 6 "	5 10 0

[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall.....	105s. 0d. to 112s. 6d.
Hot Blast, ditto.....	65s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

Gas-Tubes.....	67½ p.c.
Water-Tubes.....	62½ "
Steam-Tubes.....	57½ "
Galvanised Gas-Tubes.....	55 "
Galvanised Water-Tubes.....	50 "
Galvanised Steam-Tubes.....	45 "

	10cwt. casks.	5cwt. casks.
	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0 to	£24 10 0
Do., Vieille Montagne.....	26 5 0 "	26 15 0
Sheet Lead, 3lb. and upwards.....	13 17 6 "	13 17 6
Lead Water Pipe (F.O.R. Lead).....	14 7 6 "	14 7 6
Lead Barrel Pipe.....	15 2 6 "	15 2 6
Lead Pipe, Tinned inside.....	16 2 6 "	16 2 6
" " " and outside.....	17 12 6 "	17 12 6
Composition Gas-Pipe.....	16 2 6 "	16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6 "	16 2 6
Pig Lead, in 1cwt. pigs.....	10 16 3 "	10 17 6
Lead Shot, in 28lb. bags.....	15 0 0 "	15 5 0
Copper Sheets, sheathing and rods.....	75 0 0 "	75 5 0
Copper, British Cake and Ingots.....	61 10 0 "	62 0 0
Tin, Straits.....	123 0 0 "	124 0 0
Do., English Ingots.....	124 0 0 "	124 10 0
Spelter, Silesian.....	20 15 0 "	21 0 0

TIMBER.

	per load	£10 0 0 to	£18 10 0
Teak, Burmah.....	9 15 0 "	16 10 0	
" Bangkok.....	3 17 6 "	6 5 0	
Quebec Pine, yellow.....	4 15 0 "	7 10 0	
" Oak.....	5 10 0 "	10 5 0	
" Birch.....	4 10 0 "	9 0 0	
" Elm.....	4 15 0 "	8 5 0	
" Ash.....	2 12 6 "	6 10 0	
Danitic and Memel Oak.....	2 7 6 "	5 5 0	
Fir.....	2 7 6 "	5 5 0	
Wainscot, Riga p. log.....	4 0 0 "	6 0 0	
Lath, Danitic, p.f.....	7 15 0 "	8 0 0	
St. Petersburg.....	7 0 0 "	15 0 0	
Greenheart.....	0 3 6 "	0 3 9	
Box.....	0 0 8 "	0 0 8	
Sequoia, U.S.A. per cube foot	0 0 8 "	0 0 8	
Mahogany, Cuba, per super foot	0 0 8 "	0 0 8	
Im. thick.....	0 0 8 "	0 0 8	
" Honduras.....	0 0 4 "	0 0 5	
" Mexican.....	0 0 3 "	0 0 5	
" African.....	0 0 3 "	0 0 5	
Cedar, Cuba.....	0 0 3 "	0 0 5	
" Honduras.....	0 0 3 "	0 0 5	
Satinwood.....	0 0 3 "	0 0 5	
Walnut, Italian.....	0 0 3 "	0 0 5	
" American (logs).....	0 0 3 "	0 0 5	

Deals, per St. Petersburg Standard, 120—12ft. by 1½in.

	by 1½in. :—
Quebec Pine, 1st.....	£22 0 0 to
" 2nd.....	18 5 0 "
" 3rd.....	11 15 0 "
Canada Spruce, 1st.....	11 10 0 "
" 2nd and 3rd.....	8 10 0 "
New Brunswick.....	8 0 0 "
Riga.....	7 10 0 "
St. Petersburg.....	8 10 0 "
Swedish.....	11 10 0 "
Finland.....	9 0 0 "
White Sea.....	12 0 0 "
Battens, all sorts.....	6 10 0 "
Flooring Boards, per square of 1in. :—	
1st prepared.....	£0 13 6 "
2nd ditto.....	0 12 0 "
Other qualities.....	0 6 3 "
Staves, per standard M :—	
U.S. pipe.....	£37 10 0 "
Memel, cr. pipe.....	220 0 0 "
Memel, brack.....	190 0 0 "

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 4
Red Mansfield ditto.....	" "	0 2 4
Hard York ditto.....	" "	0 2 1
Ditto ditto 6in. saws both sides, landings, random sizes.....	per foot sup.	0 2
Ditto ditto 3in. slabs sawn two sides, random sizes.....	" "	£0 1
* All F.O.R. London.		
Bath Stone, delivered on rail at quarry stations.....	per foot cube	£0 1
Delivered on road waggons, Paddington Depot.....	" "	0 1 6
Ditto ditto Nine Elms Depot.....	" "	0 1 8
Portland Stone, in random blocks of 20ft. average :—		
Brown.....	White	Base Bed.
Delivered to railway depot at the quarry.....	per foot cube	£0 1 5½
Delivered on road waggons at Paddington Depot.....	" "	0 2 1
Ditto Nine Elms Depot.....	" "	0 2 2
Ditto Pimlico Wharf.....	" "	

	FEVRE AND CO.	s. d.
Blocks Palette Banc Franc.....	1 5	per c. ft. ex. steamer London
Ditto ditto Banc Royal.....	1 3	do. do.
Ditto Euville.....	1 9	do. do.
Ditto Comblanchieu.....	3 0	do. do.
Ditto Massangis (Roche).....	2 6	do. do.

OILS.

	per tun	£18 17 6 to	£19 7
Linseed.....	24 0 0 "	24 10	
Rapeseed, English pale.....	22 10 0 "	22 15	
Do., brown.....	24 0 0 "	25 10	
Cottonseed, refined.....	32 0 0 "	32 0	
Olive, Spanish.....	26 0 0 "	29 0	
Seal, pale.....	30 0 0 "	31 0	
Cocanut, Cochon.....	24 10 0 "	25 0	
Do., Ceylon.....	27 10 0 "	27 15	
Palin, Lagos.....	17 5 0 "	19 5	
Oleum.....	0 7 0 "	0 8	
Lubricating U.S.....	0 0 5½ "	0 0	
Petroleum, refined.....	1 8 0 "	1 6	
Tar, Stockholm.....	9 19 8 "	1 0	
Do., Archangel.....	37 0 0 "	37 5	
Turpetine, American.....	37 0 0 "	37 5	

The work of widening London Bridge is being pushed forward rapidly. Much of the new granite balustraded parapet is fixed in position, and it is hoped that all will be completed by March next. The contractors, Messrs. Pethick and Brothers, are asking for tenders for the purchase of the temporary footbridges.

LIST OF COMPETITIONS OPEN.

Howden, Yorks—Sewerage Improvement	£15	Henry Green, Clerk, R.D.C. Offices, Howden, Yorks	Sept. 12
Stonehaven—Additions to Town Hall		George Murdoch, Burgh Surveyor, Stonehaven, N.B.	12
Ayr—Hospital		J. E. Shaw, Clerk to Lunacy Board, County Buildings, Ayr ..	22
Tamworth—Free Public Library (J. A. Cossins, Assessor) ..	£20, £10, £5	J. Matthews, Town Clerk, Bolebridge-street, Tamworth ..	15
Newton-in-Makerfield—War Memorial Monument (£300) ..	£10 (merged) ..	C. Cole, Hon. Sec., Town Hall, Earlstown, Lancs	25
Leyland, Lancs—Laying-out Land (11,902 square yards) ..	£15 15s ..	M. H. Wilkinson, Surveyor, 21, Towngate, Leyland	26
Brighton—Hospital for Women (Assessor)	£50, £30, £20	Leonard Holmes, Hon. Sec., 76, West-street, Brighton	29
Dublin—Workmen's Cottages		Francis B. Ormsby, Secretary, Kingsbridge Terminus, Dublin ..	30
Heywood—Library (£4,500)		J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood ..	Oct. 1
Bromley, E.—Public Library	£20 (merged), £20, £10	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E ..	2
Saltwood, Elham—Sewage-Disposal Scheme	£75 (merged), £25	R. Loneragan, Clerk, 11, Cheriton-place, Folkestone	7
Rawtenstall—Free Library and Town Hall (Assessor) ..	3igs.	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	12
Harrogate—Pump-Room and Colonnade in Valley Gardens ..	£100, £50, £30	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate ..	26
Sunderland—Additions to Town Hall	£100, £50, £25	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland ..	Nov. 21
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Aylesford—Single-Span Stone Bridge over Medway (Assessor) ..	100gs.	The Town Clerk, Maidstone	—

LIST OF TENDERS OPEN.

BUILDINGS.

Fence Houses—Business Premises and Cottages	Chester-le-Street Industrial Society..	J. G. and R. G. Cowe, Chester-le-Street	Sept. 12
Wakefield—Repairs to Spire of Cemetery Chapel		The City Surveyor, Town Hall, Wakefield	12
Berwick-on-Tweed—Three Houses, Pier-road		J. M. Edny and Co., Sandgate	12
Stainland—Addition to Residence at Glen-view		J. Berry, Architect, 3, Market-place, Huddersfield	12
Eastbourne—Operating-Room &c.	Princess Alice Hospital Governors	Rowland Plumble and Harvey, Architects, 13, Fitzroy-square, W.	12
Bradford—Shed Flooring (1,600 square yards) at Atlas Mills ..		Walker and Collinson, Architects, Swan-arcade, Bradford	12
Newtonmore—Villa		A. Cattnach, Architect, The Laurels, Kinsgussie	12
Hartwell—Two Houses		Fred. Taylor, A.R.I.B.A., 26, Temple-street, Aylesbury	12
Coventry—Boiler-House	Guardians	T. F. Pickner, High-street Chambers, Coventry	12
Thornton—Fifteen Houses		W. Pickels, Architect, Thornton, Yorks	12
Ossett—Four Houses and Two Shops		B. Watson, Architect, Station-road, Batley	12
Marazion, Cornwall—Day Schools		Frank St. Aubyn, Architect, Lambe Buildings, Temple, E.C.	12
Forres—Rebuilding Steading		A. and W. Reid and Wittet, Architects, Elgin	12
Cwmefinlach—Twenty Houses	Cwmefin Building Club	J. Boothman, School House, Ynysddu, Wales	14
Pontypridd—Public Offices, Morgan-street	Urban District Council	Henry T. Hare, F.R.I.B.A., Architect, 13, Hart-street, W.4.	14
Nantgoy—Farmhouse		Edward Edwards, Maesruddud Estate Office, Blackwood, Mon.	14
Limavady—Two Cottages at Ballyleghy	Rural District Council	W. Crawford, Clerk, Council Offices, Limavady	14
Finchley, N.—Sixty Dwellings, Spire-lane	Urban District Council	E. H. Lister, Clerk, Council Offices, Church End, Finchley	14
Armagh—Four Cottages and Dormitory at Asylum	Committee	R. H. Dorman, C.S., Court House, Armagh	14
Llanfyllin—Wesleyan Chapel		T. Ridge, Architect, Llanfyllin, Wales	14
Dundalk—Extension of Fitting Shops	Great Northern (Ireland) Railway Co.	The Company's Engineer-in-Chief, Dublin	14
Wem—Market House	Urban District Council	James Brown, Architect, 12, Castle-street, Shrewsbury	14
Limavady—Two Cottages at Carrowmore	Rural District Council	W. Crawford, Clerk, Council Offices, Limavady	14
Edinburgh—Extension of Electric Power Station	Corporation	R. Morham, City Architect, Public Works Office, Edinburgh ..	14
Corbridge—Extensions to Branch Premises		The Secretary, West Wyman and Prudhoe Co-op. Society, Corbridge ..	14
Pennyraig—Two New Departments	Ystradgynodwg School Board	J. Rees, Architect, Hillside Cottage, Penre	14
Croydon—Extension of Electricity Works, Factory-lane ..	Corporation	The Deputy Borough Engineer's Office, Town Hall, Croydon ..	14
Wolston—Thirty-Four Cottages	Blunell Bros.	H. W. Chatterway, Architect, Trinity Church-yard, Coventry ..	14
Pontyminster—Church Mission-room and Sunday School ..		E. N. Johnson, Architect, Eveson, Mon.	14
Limavady—Four Cottages at Crinale	Rural District Council	W. Crawford, Clerk, Council Offices, Limavady	15
Casrau—Twenty-eight Houses	No. 3 Building Society	J. P. Gibbon, Mining Offices, Maesteg, Wales	15
Manchester—Public Washhouse	Corporation	The City Architect, Town Hall, Manchester	15
Halifax—Alterations to Albert Foundry		Jackson and Fox, Architects, 7, Lawson-street, Halifax	15
Leeds—Engine Foundations, Whitehall-road	Electric Lighting Committee	Milnes and France, Architects, 99, Swan-arcade, Bradford	15
Bradford—Alterations to Barkerend School	School Board	Thomas Garbutt, Clerk, School Board Offices, Manor-row, Bradford ..	15
Aspatia—Two Houses		No. 4, Lawson-street, Aspatia, Cumberland	15
Wellingborough—Two Cottages on Savage Farm	Urban District Council	J. E. H. de Key, Surveyor, Park-road Wellingborough	15
Ascot—Queen's Hall and Police Station	Berkshire Standing Joint Committee	Joseph Morris, County Sur., Broadway Buildings, Reading	15
Cadiz—Asylum and Maternity Homes		The President, Economic Board, Cadiz	15
Ferriby—Station Buildings	North-Eastern Railway Co.	W. Bell, Architect, York	16
Banbridge—Enlarging Church-street Schools	Select Vestry	W. W. Larnor, A.M.I.C.E., Banbridge	16
Armdenden—Renewing Steading		William Clark, Architect, Methlick, N.B.	16
Smithies, Barnsley—School	Wesleyan Reform Trustees	Wade and Turner, Architects, 10, Pitt-street, Barnsley	16
Belfast—Pavilion in Falls Park	Parks Committee	Sir Samuel Black, Town Clerk, Belfast	16
Hull—Shop, Anlaby-road	North-Eastern Railway Co.	William Bell, Architect, York	16
Colchester—Two Cottages, Merson-road		J. W. Start, F.S.I., Architect, Cups Chambers, Colchester	16
Llanbadach—Additions to Schools	Eglwysilan School Board	J. H. Phillips, Architect, Windsor-place, Cardiff	16
Kinsale—Five Cottages	Rural District Council	R. Evans, Engineer, 53, South Mall, Cork	16
Belfast—Greenhouse in Woodvale Park	Parks Committee	Sir Samuel Black, Town Clerk, Belfast	16
Hessle—Station Buildings	North-Eastern Railway Co.	W. Bell, Architect, York	16
Levenshulme—Carnegie Free Library	Urban District Council	J. Jephson, Guardian Chambers, Tiviot Dale, Stockport	16
Birmingham—Engine and Boiler-Houses, &c.	Corporation	Mansergh and Sons, Engineers, 5, Victoria-street, Westminster ..	16
Kirkby-in-Furness—Additions to Co-operative Stores ..		J. Newby, Architect, Cartmel	16
Brough—Station Buildings	North-Eastern Railway Co.	W. Bell, Architect, York	16
Epsom—Destructor Buildings, Hook-road	Urban District Council	E. B. Capen, Surveyor, Council Offices, Church-street, Epsom	17
Ivybridge—Cowhouse on Glee Farm		Adams and Son, Estate Agents, Plympton	17
Greenwich—Jobbing Work One Year	Borough Council	F. Robinson, Town Clerk, Town Hall, Greenwich-road, S.E.	17
Bridlington—Greenhouse near Quay-road	Corporation	E. B. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington ..	17
High Wycombe—Lodge at Isolation Hospital	Rural District Council	B. L. Reynolds, Clerk, 12, Easton-street, High Wycombe	17
Nant-y-fyllon—Calvinistic Methodist Chapel		The Rev. H. Solva Thomas, Garmwren-terrace, Nant-y-fyllon ..	17
Borough, S.E.—Roof Repairs at St. George's Workhouse ..	Southwark Union Guardians	A. J. Wade, Architect, 35, Fifth Avenue, Harrow-road, W.	17
Fairlight, near Hastings—Coastguard Buildings	Admiralty	Director of Works Dept., Admiralty, 21, Northumberland-av., W.C.	18
Portsmouth—Manual Instruction Centres	Education Committee	A. H. Bone, Architect, Cambridge Junction, Portsmouth	18
Scarborough—Additions to Stables	Town Council	The Borough Engineer's Office, St. Nicholas-street, Scarborough ..	19
Newfield—Converting Two Cottages into Workmen's Club ..	Workmen's Club Co.	J. Foster, Secretary, Chalmers-street, Wellington	19
Horton—Nine Half-Tadded Rooms	London County Council	R. W. Partridge, Clerk to Asylum Committee, 6, Waterloo-pl., S.W.	19
Lancaster—Produce Market	Properties Committee	J. C. Mount, Borough Surveyor, Town Hall, Lancaster	19
Aberaman—Rebuilding Co-operative Shops	Cwmfach Industrial Co-op. Society	R. Rolnick, Architect, Aberdare	19
Knowle, Fareham—Engine-House at County Asylum ..	Committee of Visitors	W. J. Taylor, County Surveyor, The Castle, Winchester	21
Motherwell—Carnegie Public Library	Town Council	Greig, Fairbairn, and McEwen, Architects, Edinburgh	21
Stepney, E.—Alterations to Cider Stores, Butcher-row ..	John Symons and Co., Ltd.	Charles Dunn, Architect, Clement's-lane, Lombard-street, E.C.	21
Middlesbrough—Infants' School (500 places)	Education Committee	Charles Dunn, Son, and Walburn, Architects, Albert-rd., Middlesbrough ..	21
Rugby—Three Cottages	Urban District Council	J. Bottomley, A.M.I.C.E., Surveyor, Rugby	21
Muswell Hill, N.—New Sorting Office	H.M. Commissioners of Works	D. G. Macdonald, A.M.I.C.E., Surveyor, Storey's Gate, S.W.	22
Fraserburgh—Manse, King Edward-street	West U.P. Church	William S. E. Wilson, Architect, Frith-street, Fraserburgh	22
Wandsworth, S.W.—Swimming-Bath, High-street	Borough Council	The Surveyor's Office, High-street, Wandsworth, S.W.	22
Poulton, Dover—Laundry, &c.	Dover Town Council	H. B. Stilgoe, A.M.I.C.E., Boro' Eng., Biggin-street, Dover	22
Wigan—Enlargement of Post Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	22
Swindon—Car Depot Buildings	Corporation	Lacey and Sillar, Engineers, 78, King-street, Manchester	23
Rhymney—Twenty-nine Houses, Rowles-square	Victoria Building Club	W. H. Trump, Solicitor, Rhymney, Wales	23
Birmingham—Council School, Oldknow-road	City Education Committee	H. T. Buckland, Architect, 25A, Paradise-street, Birmingham	23
Saltash—Renovating Wesleyan Sunday-Schools		J. H. Pooley, 104, Fore-street, Saltash	24
Woolwich—Public Baths	Borough Council	F. Sumner, Borough Engineer, Maxey-road, Plumstead	24
Barry Docks—Mercantile Marine Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	24
Abbey Wood—Elementary School (150 places)	Erith Education Committee	W. Egerton, Architect, 12, Queen's-road, Erith	25
Saltburn—Wesleyan Church and Schools		Garside and Pennington, Architects, Pontefract	26
Wigan—Cemetery Extension Works		W. B. Johnson and Sons, Architects, 31, King-street, Wigan	26
Ealing Dean, W.—New Sorting Office	Borough Council	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	29
Halifax—Silversmith's Works	Charles Horner	Walsh and Nicholas, Architects, Museum Chambers, Halifax	29
Ealing, W.—Additions to Telephone Exchange	H.M. Commissioners of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	29
Hampstead, N.W.—Tenements, Lymington-road	Borough Council	O. E. Winter, A.M.I.C.E., Borough Eng., Town Hall, Hampstead ..	30
Bradford—Office	Corporation	James Watson M.I.C.E., Town Hall, Bradford	Oct. 1
Barry—Central Public Library, Holton-road	Urban District Council	Hutchinson and Harding Payne, Architects, 11, John-street, W.C.	2
St. Marys, Isles of Scilly—Coastguard Buildings	Admiralty	The Supt. Civil Engineer, H.M. Dockyard, Devonport	2
Stratford, E.—Repairing Abbey Mills Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	6
Fulham, S.W.—Two Lodges in South Park	Borough Council	Francis Wood, A.M.I.C.E., Engineer, Town Hall, Fulham, S.W.	7

BUILDINGS—continued.

Watford—Additions to Wards at Workhouse	Guardians	C. P. Ayres, Architect, Burvale, Watford	—
Clitheroe—Roman Catholic Club		F. C. Howard Sandbach, Archt., 13, Richmond-terrace, Blackburn	—
Padstow—St. Leonard's National Schools		Thomas Bell, Architect, 14, Grimshaw-street, Burnley	—
Ebbw Vale—Rebuilding Drying Inn		John J. Swallow, Architect, Steam Packet Chambers, Newport, Mon.	—
Consett—Additions to House at Middles Farm	Phillips and Sons, Ltd.	R. G. Moore, 5, Rosebery-terrace, Consett	—
Pontnewydd—Additions to Bridge End Inn	W. Hancock and Co.	N. M. Brown, A.R.I.B.A., Dock-street, Newport, Mon.	—
Chipstead, Surrey—Residence and Outbuildings		H. G. Gribble, Architect, Mill View, St. John's, near Woking	—
Branksome—Public Library, Lake-road		Samuel J. Newman, F.R.I.B.A., Branksome, Parkstone	—
Truro—Alterations to Premises	Oscar Blackford	Silvanus Trevel, F.R.I.B.A., Truro	—
Shepherd's Bush, W.—Shops and Flats, Uxbridge-road		Palgrave and Co., Architects, 28, Victoria-street, Westminster	—
Leeds—Additions to House and Stables	John T. Lack	Mossley and Co., Estate Agents, 6, Wormwald-row, Leeds	—
Clacton-on-Sea—Residence		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	—
Harrrogate—Farmhouse at Pannal Ash		Bolshaw and Stevens, Architects, 1, Princes-street, Harrrogate	—
Evenwood—House	A. Maddison	Pegg and Farrow, Architects, 7, Market-place, Barnard Castle	—
Blackburn—Cottage Homes for Disabled Soldiers		McCall and Robinson, Architects, 7, Tacketts-street, Blackburn	—
Fulfleet—Twenty Workmen's Cottages		V. Millett, 72, Bishopsgate-street Within, E.C.	—

ELECTRICAL PLANT.

Sydney—Generating Set	N.S.W. Railway Commissioners	The Agent-General for New South Wales, 9, Victoria-street, S.W.	Sept. 12
Whitechapel, E.—Electric Lighting at Infirmary	Guardians	F. J. Tootell, Clerk, Union Offices, 74, Vallance-road, N.E.	" 12
Southend-on-Sea—Electrical Plant	Corporation	W. E. J. Heenan, M.I.E.E., Boro' Elec. Eng., Southend-on-Sea	" 14
Kirkcaldy—Wiring, &c., Memorial Halls	Corporation	Wm. L. Macindoe, Town Hall, Kirkcaldy	" 14
Glasgow—Wiring Baths, Baltic-street	Corporation	J. Lindsay, Clerk, City Chambers, Glasgow	" 16
Rotherham—Electric Watering-Car	Tramways Committee	H. Hampton Copnall, Town Clerk, Town Hall, Rotherham	" 18
Madrid—Telegraph and Telephone Apparatus		The Director General of Posts, Madrid	" 19
Rochdale—Underground Cables and Switchboard Alterations	Guardians	Shepherd and Watney, Greek-street Chambers, Leeds	" 26
Launceston, Tasmania—Electric Meters (500)	Corporation	Wm. Corin, City Elec. Engineer, Launceston, Tasmania	" 28
Dublin—Electric Crane (100-ton)	Port and Docks Board	John P. Griffith, M.I.C.E., East Wall, Dublin	Oct. 5
Johannesburg—Plant	Municipal Council	Morley and Dawbarn, 82, Victoria-street, Westminster, S.W.	" 19

ENGINEERING.

Woodford—Fire-Escapes	Urban District Council	W. Farrington, Surveyor, Woodford Green, Essex	Sept. 14
Edinburgh—Extending Macdonald-road Electric Station	Corporation	R. Morham, City Architect, City Chambers, Edinburgh	" 14
Portsmouth—Pump Repairs		A. Holland, Town Clerk, Town Hall, Portsmouth	" 14
Okehampton—Fire-Escape	Town Council	Fras. J. Worden, Borough Surveyor, Town Hall, Okehampton	" 14
Fulham, S.W.—Pumping-Plant at Baths	Borough Council	R. M. Prescott, Town Clerk, Town Hall, Fulham, S.W.	" 14
Westend, Southampton—Filter-Beds	South Stoneham Union Guardians	W. H. Mitchell, Son, and Gutteridge, Architects, Southampton	" 14
Aultbea, Ross-shire—Pier at Aird Point		J. Mannors, M.I.C.E., 12, Lombard-street, Liverpool	" 14
Nottingham—Calendar at Bagthorpe Workhouse	Board of Guardians	G. Muncester Howard, Clerk, Poor Law Offices, Nottingham	" 15
Pittenweem—Quay and Harbour Excavation	Town Council	D. and C. Stevenson, 84, George-street, Edinburgh	" 15
Havre—Tidal Quay		M. Renard, Ingenieur des Ponts et Chaussees, Havre	" 15
Talgarth—Waterworks	Hay Rural District Council	R. E. W. Berrington, M.I.C.E., Bank Buildings, Wolverhampton	" 16
Wimbleton—Heating Chamber at School	Education Committee	Thomson and Pomeroy, Architects, Hill-road, Wimbleton	" 16
Devizes—Bacteria Beds	Urban District Council	Beesley, Son, & Nicholls, Engs., 11, Victoria-st., Westminster, S.W.	" 17
Lichfield—Sewerage Works	Rural District Council	W. E. Rogers, Engineer, Rugeley	" 17
Bridlington—Lengthening Clough Bridge	Corporation	E. R. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington	" 19
Worthing—Iron Bridge	Mitford and Launditch R.D.C.	E. J. Silcock, Engineer, King-street, King's Lynn	" 19
Paddington, W.—Four Sweeping Machines	Borough Council	E. B. B. Newton, A.M.I.C.E., Sur., Town Hall, Paddington, W.	" 20
Stewarton—Storage Reservoir at White Loch	Town Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow	" 21
Bermondsey, S.E.—Destructor, &c.	Borough Council	Kincaid, Waller, Manville, and Dawson, 29, Great George-st., S.W.	" 21
Irthlingborough—Pipelining (5½ miles)	Urban District Council	John Waugh, C.E., Sunbridge Chambers, Bradford	" 22
Jassy, Roumania—Waterworks	Corporation	M. Paiano, Engineer, Technical Office, Jassy, Roumania	" 22
Irthlingborough—Engines	Urban District Council	John Waugh, C.E., Sunbridge Chambers, Bradford	" 22
Eccles—Reconstructing Menton Bridge	Corporation	C. S. Allott and Son, 46, Brown-street, Manchester	" 26
Martock—Water Supply Extension	Yeovil Rural District Council	Bailey-Denton and Partners, M.M.I.C.E., 9, Bridge-street, S.W.	" 28
Conway—Sewerage and Waterworks	Rural District Council	T. B. Farrington, A.M.I.C.E., Trinity-square, Llandudno	" 30
Aogtina, Bradford—Masonry Dam (1,260ft. by 130ft.)	Corporation	James Watson, Waterworks Engineer, Town Hall, Bradford	Oct. 1
Bradford—Three Service Reservoirs	Corporation	James Watson, Waterworks Engineer, Town Hall, Bradford	" 1
Nottingham—Pumping Engines	Water Committee	Stephen Moore, General Manager, St. Peter's-square, Nottingham	" 5
Greenwich, S.E.—Four 5,000 H.P. Steam-Engines	London County Council	The Clerk, County Hall, Spring Gardens, S.W.	" 6
Vauxhall, S.W.—Steel Superstructure of New Bridge	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Valletta, Malta—Lift Construction		The Receiver-General and Director of Contracts, Malta, Valletta	" 30
Cairo—Three Road Bridges over the Nile	Ministry of Public Works	The C. Intel. Branch, Board of Trade, 50, Parliament-st., S.W. (1904)	Feb. 1
Stamford—Stone-Breaking Machine	Corporation	T. W. A. Hayward, A.M.I.C.E., Borough Surveyor, Stamford	—

FENCING AND WALLS.

West Mersea—Iron Fencing (220 yards)	Lexden and Winstree R.D.C.	J. Ennals, Surveyor, Copford, Sussex	Sept. 12
Bradford—Alterations to Boundary Walls	School Board	T. Garbutt, Clerk, Manor-road, Bradford	" 15
Leeds—Boundary Wall and Gates, Springfield-street		The City Engineer's Office, Municipal Buildings, Leeds	" 21
Northampton—Horizontal Iron Fencing (400 yards)	Corporation	Alfred Fidler, A.M.I.C.E., Guildhall, Northampton	" 26
Radcliffe—Stone Fence Walls, &c., at Cemetery	Urban District Council	W. L. Rothwell, Engineer, Radcliffe, Lancs	" 26
Wigan—Boundary Walls at Cemetery	Sanitary Board	W. B. Johnson and Sons, Architects, 3, King-street, Wigan	" 26
Radcliffe—Iron Fencing and Gates at Cemetery	Urban District Council	W. L. Rothwell, Engineer, Radcliffe, Lancs	" 26
Cape Town—Fencing Sheds, Band Stands, Fountains, &c.	International Exhibition	The Offices, Palmerston House, Old Broad-street, E.C.	—

FURNITURE AND FITTINGS.

Selly Oak—Furnishing Workhouse Pavilion	King's Norton Union Guardians	R. J. Curtis, Clerk, Guildhall Buildings, Birmingham	Sept. 21
Exeter—School Furniture	Devon County Council	The County Education Office, 59, Queen-street, Exeter	" 21
Bagthorpe—Furnishing Sanatorium at Workhouse	Nottingham Board of Guardians	G. Muncester Howard, Clerk, Poor Law Offices, Nottingham	" 23
Workshop—Furnishing Isolation Hospital	Hospital Committee	F. Hopkinson, Architect, 40, Bridge-street, Workshop	" 28

PAINTING.

Plymouth—Workmen's Homes, Prince Rock		James Paton, Borough Engineer, Plymouth	Sept. 12
Newtownmore—Villa		A. Cattanaach, Architect, The Laurels, Kingussie	" 12
Forres—Steading		A. and W. Reid and Wittet, Architects, Elgin	" 12
Birmingham—Parish Offices	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 14
Dewsbury—Cottage Homes, Healds-road	Guardians	Joseph Peace, Clerk, Wellington-street, Dewsbury	" 17
Saltash—Wesleyan Sunday Schools		J. H. Pooley, 104, Fore-street, Saltash	" 24
Stratford, E.—Abbey Mills Pumping Station	London County Council	The Engineer's Dept., County Hall, Spring Gardens, S.W.	Oct. 6

PLUMBING AND GLAZING.

Abergavenny—Plumbing Work (Six Months)	Town Council	The Borough Surveyor, Abergavenny	Sept. 16
Motherwell—Carnegie Public Library	Town Council	Greig, Fairbairn, and McNiven, Architects, Edinburgh	" 21
Halifax—Silvius Smith's Works	Charles Horner	Walsh and Nicholas, Architects, Museum Chambers, Halifax	" 29

ROADS AND STREETS.

Scoby—Whirstone Sett Paving	Urban District Council	Bruce McG. Gray, A.M.I.C.E., Town Surveyor, Town Hall, Scoby	Sept. 12
Rugby—Road and Park Works	Urban District Council	D. G. Macdonald, A.M.I.C.E., Surveyor, Rugby	" 12
New Shildon—Paving Streets	Urban District Council	Charles Heslop, Surveyor, Council Chambers, Shildon	" 12
Finchley, N.—Wood-Paving GL North-id. and East Finchley	Urban District Council	C. J. Jenkin, A.M.I.C.E., Engineer, Church End, Finchley	" 12
Surbiton—Cartway Approach	Urban District Council	James Bell, Clerk, Council Offices, Surbiton	" 14
Halifax—Private Improvement Works	Highways Committee	James Lord, C.E., Borough Engineer, Town Hall, Halifax	" 14
Stockton-on-Tees—Improvement Works	Corporation	M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees	" 14
North Shields—Paving Streets	Tynemouth Corporation	John F. Smillie, Borough Surveyor, Tynemouth	" 15
Isleworth—Making-up Gaining-road	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	" 16
Trowbridge—Asphalt Paving (750 yards)	Urban District Council	H. G. Nicholson-Lalley, Town Surveyor, Town Hall, Trowbridge	" 16
Isleworth—Making-up Nottingham-road	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	" 16
Earlestown—Street Works	Newton-in-Makerfield U.D.C.	The Surveyor, Town Hall, Earlestown, Lancs	" 16
Isleworth—Making-up Castle-road	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	" 16
Isleworth—Making-up Loring-road	Urban District Council	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	" 16
Croydon—Making-up Streets	Rural District Council	R. M. Chart, F.S.I., Town Hall, Croydon	" 17
Ashford, Kent—Making-up Queen's-road Extension	Urban District Council	William Terrill, Surveyor, 5, North-street, Ashford, Kent	" 18
Rugby—Forming Park-road	Urban District Council	D. G. Macdonald, A.M.I.C.E., Surveyor, Rugby	" 21
Southgate—Tar Paving (5,000 yards)	Urban District Council	C. Griffin Lawson, C.E., Surveyor, Palmer's Green, N.	" 21
Lytchett Minster, Dorset—Roads	Sir Elliott Lees, Bart., M.P.	R. T. S. Seymour, Surveyor, Wimborne	" 21
Hammersmith, W.—Making-up Bracewell-road	Borough Council	H. Thompson, Clerk, Town Hall, Broadway, Hammersmith	" 21
Chiswick, W.—Making-up Airdale-av. & Compton-crescent	Urban District Council	John Barclay, Surveyor, Town Hall, Chiswick	" 21
Hammersmith, W.—Asphalting Norland-road	Borough Council	H. Thompson, Clerk, Town Hall, Broadway, Hammersmith	" 21
Batley—Street Works	Town Council	O. J. Kirby, Borough Surveyor, Branch-road, Batley	" 21
Hammersmith, W.—Asphalting Cardross-street	Borough Council	H. Thompson, Clerk, Town Hall, Broadway, Hammersmith	" 21
Nelson—Street Works, Lowther-street	Streets Committee	B. Ball, A.M.I.C.E., Borough Engineer, Town Hall, Nelson	" 21
Walthamstow—Street Works	Urban District Council	G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow	" 21
Laydonham—Kerbing Water-street and High-street	Cosford Rural District Council	Ernest W. Yeale, C.E., Surveyor, Bildeston	" 21
Hippelholme—Flagging, &c.	Urban District Council	Geo. W. Thompson, Surveyor, Hipperholme	" 21

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ACOUSTICS.

ALL attempts to explain the laws which should govern the planning and arrangement of buildings that are favourable to sound are of little value if based on only one of the conditions, such as certain proportions of plan and height, though these may much facilitate the propagation of the waves of sound. Theories unfortunately help architects very little on questions which depend on so many factors, such as the purpose of the building, the materials of which it is composed, their resonant qualities, the currents of air in the building as determined by the mode of ventilation, the smoothness or roughness of the walls, the kind of roof or ceiling, and the obstacles in the way of the propagation of the waves of sound. Yet these are all manageable ones; they can all be determined by experiment, and we can find out much about them. For example, the resonant properties of stone, brick, glass, wood of various kinds, iron, plaster, drapery, and other substances can and have been determined, and we have only to apply the conclusions to the particular building. In short there are no two buildings that can be properly judged acoustically on the same basis when their materials vary considerably. Their walls are of different materials and thickness; one may be plastered, the other panelled with wood. The roof or ceiling in each case may have differing degrees of resonance, be of different form, one have timber principals, the other perfectly smooth plaster with slight moulded ribs, or one be coffered with a flat ceiling, the other arched or deeply coved; the sittings and fittings of each may also vary. Apart from structural differences, the currents of air in each hall or room may be in different directions, all of which things considerably modify sound. As one writer on the subject has said, it seems strange in an age of specialised knowledge that there should not be certain definite data as to what constitutes a bad or a good hall, or to what its defective qualities are to be attributed, and that the architect should not be able to determine in advance what will insure good acoustic properties. "As a matter of fact, however," he points out, "there is no department of applied science to-day in which the available knowledge is so deficient as in acoustics." But the architect has to grope his way in the dark; he has to take the few strands of knowledge which experiment has left, and try to find out for himself the qualities and points which are most favourable to his purpose. Definite data from certain conditions ought to be within his reach, but these cannot be deduced from a limited experience. Thus it would not be prudent to depend in every case upon a certain shape of ceiling, though in one case we knew the acoustics were good. And it has been found the same in the shape and proportions of a hall. The same plan and dimensions which have produced good results in one building have not been found successful in a second situated on another site, so that we cannot arrive at any scientific deduction by taking the result in one or two cases, and imagine that by applying the same data to another building we shall be sure of success. Certain results derived from personal experience are nevertheless of value if they can be properly attested—that is to say, if the observers are careful in every instance to record the exact

conditions of the building, its materials, plan, and structure and fittings in detail.

We are not now discussing the subject systematically, but only endeavouring to point out a few of the opinions that have been advanced. More has been accomplished in the way of experiment in America than with us. The symphony halls which have been erected of late years in New York, Boston, and other cities of the West, have directed attention to the acoustical properties of such buildings. At Boston, the lately-erected Symphony Hall is one of the first buildings erected in America, at least, where scientific planning was attempted. Before that time the design of these buildings was largely a matter of mere guesswork. It has been asserted that long before the walls of that building were up, it was known with accuracy what the acoustic properties of the auditorium were to be. The confidence thus felt was, it is stated, due to the investigations of an eminent physicist of Harvard University, Mr. Wallace C. Sabine, assistant professor of physics, who had been studying the subject for many years. He had been asked to find a remedy for the acoustic defects of a lecture-room, which led him into a thorough investigation of the question. His examinations at least have set aside as worthless the popular notions about certain proportions that had previously been held, and the theories of authors. There was, as we have said, an idea that if one building acoustically perfect was copied in its general plan and arrangement in another, the second would be also successful; but Professor Sabine shows that this is a fallacy: it can only be exactly duplicated if the conditions holding in the model are also followed in the materials used, the wall structure, the proportion, arrangement of fittings, ventilation, &c. It has been shown, indeed, by recent experimentalists that not one of the conditions or details can be varied without varying the results; but that it is possible to calculate the effect of these variations so that the architect can, by study, find out beforehand what such and such change will do, and thus by compensating variations preserve the acoustical properties of his auditorium, or of any auditorium he may have taken as a model. In short, recent experiment and investigations have established by means of certain values attached to certain materials and conditions of structure, as that of absorption of sound created by such things as drapery and cushions of the seats; that it is possible scientifically to reproduce the same effects by making compensatory variations in the planning or structural conditions. The music hall we have mentioned was planned on these principles. The architects, McKim, Mead, and White, of New York, visited Europe and consulted the scientific authorities of France and Germany; the Greek plan of theatre was thought too bold an experiment for a music hall, and the well-known auditorium in Leipsic (the Gewandhaus) was too small in capacity to be selected as a model. The Boston hall, its stage recess, sloping floor, and tiers of galleries, with its increased seating capacity, is said to be a copy of the old hall only in certain acoustical results, and not in the architectural means by which these results were attained. The new hall contains about 175,000 cubic feet more than the German one, yet it is stated that, owing to skilful calculation and careful balancing, the reverberation of the former, as expressed in the formulas prepared at Harvard, is 2.31 against 2.30 in the Leipsic hall. How has this result been accomplished? The researches at the Harvard University have embraced all the conditions and details of buildings likely to influence the acoustics. The most minute investigations have been made to ascertain the variations of different halls or rooms. For example, the acoustic effects of a room of certain size and shape, for

an audience of a certain number, has been compared with another of equal size but crowded with people. Then a small room has been compared with a larger one of like form and fittings filled with an audience. But these comparisons have gone further; the question of the effect of certain bodies and substances in absorbing sound—a very important factor in determining the sound-conveying properties of a room—has been studied, and the results tabulated. Various objects, it is well known, absorb or deaden sound more or less; thus we all know how a crowd of people in a room will appreciably deaden the sound of music, or the voice compared with an empty room, or one occupied only by a few persons. The audience, in short, becomes a very potent absorber of the sound. A number of women will absorb sound to a greater extent than men, because of their dress, and, in fact, each individual has its own value which can be determined by experiment. Then again, upholstery, carpets, curtains, and drapery in a room have a very decided effect in absorbing or deadening sound, and it is possible to put a value to each of those materials, like cushioned seats, a carpeted floor, and draped walls. A room which suffers from confused sounds or reverberation, as it is called, is often remedied by the use of any of these substances. We may here refer to a few examples of the use of absorbents in preventing reverberation or echo. Many of our public halls and public edifices are spoiled by reverberation, which renders them, even when filled by people, defective for musical and other performances. In such rooms the voice resounds, and is audible for several seconds after it emanates from the speaker, producing a confused noise very distressing to the audience. Listening to a speaker or vocalist becomes wearisome. In the case of a lecture-room in New York, this defect was remedied by placing in it a large number of cushions, and exposing their larger surfaces to the sound, by which it is stated the reverberation was reduced to about a fifth of what it had been. They acted as absorbents of the undesirable reverberation. We all know, too, what a difference it makes to the sound of a room when a carpet is laid down. Before, the voice of a person or the tread of feet makes a noisy reverberating sound; after the floor is covered the sound is clear. Even curtains hung in a room have remedied the excessive reverberation, and rendered the acoustic qualities tolerable. Then there are other kinds of absorbing materials. There is, for instance, glass, which is a large factor in the construction of halls and concert-rooms. If we take the open window as representing the unit, the absorption of glass is expressed by the fraction .025, a very small quantity. Pine boarding is expressed by .061, a rather larger fraction. A settee upholstered in hair and leather has a value of 1.10; while a settee of ash has a value of .039. These values or comparisons of absorption are of great use, as they enable the architect to rectify any excess or defect of the reverberating qualities of his structure. The open window is thus taken as the unit, because, as it is stated, "it makes no difference whether the sound escapes into the open air or is transformed into heat in some substance," and an equal area of any other material is compared with this unit as a standard. One writer says: "More curious are the figures for persons or for an audience *en masse*. A woman absorbs more than a man for the reason that her dress offers a greater surface. For the same reason a person sitting in a scattered audience absorbs more than he would if he were one of a crowded audience. An audience is reckoned as a bounding surface, like a floor. In these calculations, and its area measured in metres." A table of comparative values gives for an audience per metre .96, for an audience per person .44; isolated woman .54,

isolated man '48. It is sufficient here to give these few instances of the effect and values of absorbing surfaces, as they show how large a part they play in the acoustical result. A certain amount of resonance is desirable in hall or lecture-room. A hall without it is neither good for music nor the voice, and it is this particular quantity that it is desirable to retain. For musical performances the exact proportion of resonance to the other quality of deadness or absorption is considered more necessary than for the voice, as the tones of music are purer in quality, and more susceptible to interference: but one writer says "investigation has failed to discover a hall thoroughly satisfactory for music which was not equally good for the voice." The same writer, Mr. C. H. Blackall, in the *Technograph* of the Illinois University, says:—"Another popular fancy is that every structure has its exact note in a musical scale. . . . Personally, I do not believe it. Nor can I find that a hall has an individual pitch to which a speaker must accord his voice. It would be a poor hall indeed in which a speaker would be at his best in only one pitch, and such halls practically do not exist." We are not discussing theories here, nor do we express our views on the above opinion; but it has been almost proved by authorities on the science that every building or room has its particular "note," which depends largely on the materials of which it is composed, just as every violin or instrument has a note of its own.

Practically, the best proportions of a hall, or its relative length, breadth, and height, are questions which the architect desires to find out. Authorities differ much as to these dimensions. One author says, a perfect hall for music should be as 2 to 3 to 5; another as 1 to 1 to 2, but one may dismiss these theories as mere guesses. The author we last quoted refers to the well-known Leipsic hall we have noticed, and also to the Steinert Hall in Boston, in which the auditorium is about 60 per cent. longer than the width, and the width increases towards the rear, the side walls not being parallel, as being one of the best places for chamber music; but he mentions another hall in the same city which is much broader than it is long, but which is deficient in the quality and volume of the music. The hall of Tremont Temple in Boston is a rectangle 120ft. long and 70ft. wide, and its acoustical qualities for both vocal and instrumental music are said to be perfect. Thus these examples point to an elongated plan; but the author thinks a better plan, considering both the acoustics and the lines of sight, is a square auditorium which limits the width to 90ft., as beyond that width the extreme sides are apt to suffer. We have here a great variety of American opinion as to plan. One set of authorities advocate elongated rectangles; other writers a square or rectangular auditorium of greater width than length; a third set advocate a trumpet-shaped building, diverging outwards from the orchestra. The theory of the conduction or propagation of sound appears to favour the last idea; but it is practically a dead letter, as this type of hall requires the side walls to diverge or bevel outwards, and the ceiling to follow the same lines, while the floor must be raised at the back of hall. We have seen designs for concert-halls based on this theory, and a few years ago certain designs sent in for a hall of this description for one of ten Institute prizes were planned with the lines of walls and roof arranged on this principle.

The author we have mentioned says a "rectangular auditorium—whether concert-hall or theatre—should not have a rectangular proscenium. In theatres which are good acoustically, it is found that the walls immediately preceding the opening proscenium are built at a slight bevel outwards, and the ceiling over the fronts of these boxes and

connecting the two sides is slightly arched on the bevel corresponding to the angle of the sides," and he instances the Auditorium Theatre of Chicago, which is a great success. In this building "the bevelled walls on each side of the proscenium are carried out into the auditorium, and there appears reasonable ground for the theory that the sound issuing from the stage is in a measure directed and equalised towards the audience." There is little doubt this bevelling of the walls and ceiling outward from the stage is conducive to the proper conduction of the sound, and it is asserted that in nearly all theatres which are acoustically successful this arrangement has been followed. We may again quote Mr. Blackall: "In my judgment it is essential that the main ceiling of any auditorium should be slightly varied in level—that is to say, not one unbroken surface—and with a sufficient number of distinct breaks, either by beams, ribs, or some other architectural device, so that any sound-waves which might be supposed to impinge on the ceiling would be scattered and dispersed rather than reflected to the audience. Any arrangement of domed surfaces, however, implies a certain risk. There are very few instances which have come under my observation of domed auditoriums which were wholly successful acoustically, while there are a number of instances in which a dome was presumably the cause of poor acoustic properties. The Paris Opera House is one striking instance." The same writer does not think the form of balconies and galleries have any relation to the acoustic qualities of a house, nor that a wide "overhang" with "pockets" under the galleries is necessarily bad; and he says that Tremont Temple, which has a very deep pocket under the gallery, is faultless in this respect. But deep overhanging balconies may create awkward sight-lines and other inconveniences. The author, as we have seen, advocates well-broken ceilings, but thinks the walls are better unbroken. In the new Boston Symphony Hall the side walls are broken by pilasters and deep niches, and these breaks he thinks have not aided sound. Sanders' theatre in Harvard University has a broken ceiling and plain walls, and successful theatres show the same treatment. A slight cove between the wall and ceiling improves the effect, and certainly the appearance, but a large cove, unless well broken up in its horizontal dimension, is a source of trouble. So the author concludes: "So, then, the ideal auditorium would seem to be one with a very elaborate ceiling, rather simple walls, a width of perhaps 80ft. or 90ft., and a depth of perhaps 100ft. or 115ft., with projecting proscenium walls set at an angle to the centre line, and an arched ceiling overhead. I do not know of a single theatre which follows these lines in which bad acoustic properties have developed." The type of building or hall thus indicated appears to have common sense in its favour. Most of our old and modern churches are based on this type and proportion, except that the walls of chancel, which may be regarded as a sort of proscenium, are not bevelled. There is an exception to this in one or two modern churches where the architect has bevelled the eastern bay of his arcades and clerestory towards the chancel arch, and has at the same time reduced the height of his nave vault over this portion. The late Mr. Street, in the church of St. John the Divine, Kennington, has carried out this bevelling of the nave walls at the chancel end with undoubted success to the acoustics, and the apsidal-ended chancel also aids the effect. One of the designs submitted for Liverpool Cathedral adopted in a marked manner the same plan of converging the lines of nave to the narrowed chancel or choir. The result in both these instances is to give a wider nave for congregational use than would otherwise be practicable. Mr. J. Cubitt, in several of his executed Congregational churches, has shown a similar mode of

construction, which has proved satisfactory. The bevelled or splayed walls of a chancel or hall recess need not be built as solid as the walls, but may be so formed by partitions inside, which would give greater resonance.

Other details may be noticed, but of these we may speak in another article. The height of a platform for a concert-hall has a considerable influence in confining the body of sound, just in the same way as the lowered ceiling; but musicians differ in opinion. At the Steinert Hall, Boston, intended for piano recitals, it was thought the best results would be obtained by placing the piano on the floor; but on the score of sight a raised platform is desirable. The question of materials used in construction cannot be discussed here. As we have said, the science of acoustics has reached a more practical stage, and the architects of our concert-halls, lecture-rooms, and theatres have to consider many other things besides plan and proportion, and to adopt materials and finishings that will assist rather than destroy the results of good planning; they have to take into account the resonant as well as absorbent qualities of the materials they use and their mode of finish, and to calculate beforehand the proportion of audience and the values attached to upholstered seats and accessories.

BUILDING AT BRIGHTON.

LIKE many seaside towns which have outgrown their primitive and mixed character as fishing villages and quiet resorts, Brighton has lost much of its earlier attractiveness to the visitor, and is yearly assuming the position of a large and populous town near the sea, full of fine shops, and made to look as much like London as possible. With the very increase of its area and population, the elements which contributed to its position as the "Queen of English Watering Places" are gradually disappearing, for whatever aids in the promotion of the seaside resort and gives it its distinct character and charm is positively hostile to those signs of town growth. The great seaside town of Sussex is an illustration. Northwards, eastwards, and westwards, wherever the eye travels, it is enlarging its boundaries to an extent which would have defied expectation only a decade or two ago. What seemed impassable barriers to its growth in a northerly direction—the hilly downs—have yielded to the encroachments of the speculative builder. Visitors to the Southern watering-place, as they pass Preston, will find steep hills entirely covered with serried lines of brick and slate. These rows of new houses climb up the inclines by a succession of steps, till now very little of the grass slopes are visible: they appear incrustated with a covering of stucco and slates, which is certainly not agreeable to the artistic sense. The rural charm of the green hillside has disappeared, and a dark coating of human habitations has taken its place. The streets are laid out in long straight lines from north to south, many of them of considerable steepness; these are intersected by other straight streets of houses, which fall rapidly on either side. From The Level—now a public recreation ground—three main roads diverge: the Ditchling-road, Lewes-road, and Elm-grove. Two of these are exceedingly steep, and are traversed by lines of tramways. The facilities afforded by the corporation for rendering these northern heights of the town accessible by means of the splendid service of electric trams have been the means of rapidly developing the building estates, and, really, of indirectly spoiling the scenery of the Downs. And what is the class of building that has been erected? The interminable rows of commonplace red-brick and slated-roof dwellings which are rendering the suburbs of London in every direction so distressingly monotonous and wearisome. The elevations

to the new roads and streets are of the "jerry" builders' style, though here and there a few rows of houses of a better kind are built. In some of these the front of each house consists of a gabled portion containing the main rooms in two or three stories, and the entrance portion recessed a little, with an entrance-door beneath a lean-to roof supported on corbels. In other cases the front door is merely placed in the flat brick wall of the front, surrounded by the pretentious stone pilasters and carved arched head so well known to the London suburban resident, while the same lavish carved stonework embellishes the bay windows, usually carried up two stories. Here and there another variety of elevation is to be seen, in which gables filled with so-called "half-timbering," but which is often cement framework filled in with stucco or roughcast panels, is introduced. The gabled bay window is a common feature: the gable is sometimes half-timbered, and overhangs the bay. A few attempts to produce picturesque fronts are seen, but they are few. These rows of dwelling-houses, or "villas," as they are often called, ascend the hillsides by steps, with a regularity that tries the most ardent believer in straightness, and even makes him wish for a few more cross-roads, or a bend or two in the street, to relieve the dullness of the scene. Why these main roads, which diverge in different directions, should have been planned perfectly straight we are at a loss to understand, when they might have been arranged to follow the contour lines, and thus give a little variety to the roads. The Ditchling, the Lewes, and the Elms-grove roads are all tramway roads, and building has extended in their directions to the very boundary of the Parliamentary borough. These main thoroughfares intersect numerous cross streets, some at right angles, others obliquely. Even in the neighbourhood of the Brighton Cemetery small houses are rising, and round Preston Park a dense new neighbourhood has grown up, as anyone may see who travels by railway, the steep cliffs to the west of which are crested by terraces. The heights above sea-level of some of these roads are considerable. Taking the reduced Ordnance Map published by Bacon and Co., we find the rise of the Ditchling-road at the boundary of the borough as 349ft., while at its commencement near the Level the figure is 87ft. These data show the very steep rise of the roads which have been formed over the Downs in all directions. The local materials—flint and brick—have been pleasingly combined in many instances, the flintwork forming the main surface of wall, with courses and dressings round the window openings of red brick: the result is pleasing. Stucco is also largely used in the town, and many of the new buildings are faced with it. Perhaps in no town in England do we find better cement and stucco fronts, the architectural dressings being all run or moulded in this material. The stuccoed terraces, crescents, and squares from Hove to Kemp Town exhibit the extensive sway which stucco architecture held here during the last century, when Brighton was at the height of its prosperity. In Hove the mania for building is also evident. The Vallance Estate has some nice brick and tiled-roof villas designed in a picturesque style, in which half-timber work, tile-hanging, roughcast, and other features of the Old English timbered style are introduced; but, as usual, there is in many of these houses an effort to produce the picturesque at the sacrifice of more important qualities. The wooden balcony is a feature in many of the houses; but this can be easily overdone. Along the main tramway-road the houses are of the most depressing and commonplace kind.

Very little of a distinctly architectural character has been done of late. Two banks at each corner of North-street may be

noticed. Both are built of Portland stone, with grey granite in the basement story in one instance. The Capital and Counties Bank at the west corner has a fooled grey granite basement with stone above. The windows are mullioned, and there is a corner octagon turret springing from the circular pedimental head of the corner entrance rather boldly. This is crowned by a bell-shaped cupola of stone, but with a not very elegant termination. The London and County Bank at the opposite corner is also of Portland stone, and massively treated in the details. The lower story is the most successful part of the design. The windows are divided by bold rusticated pilasters with alternate blocks or courses of stone and red Mansfield; but it is the way these piers are separated from the windows or accentuated that is worth notice. There is a double break on each side of pilaster—first a narrow, flat face, and then a quarter-round recess on plan, which forms a kind of channel between the window architrave and the pilasters, affording a good shadow round the windows, and serve to break up the front. Above, the façade is less noticeable. Instead of narrow pilasters or architraves on each side of the windows, there is a wide panel of about half the width of opening, carved with an Arabesque ornament in low relief, and the same kind of relief is seen on each side of the main entrance at the corner. A little higher up North-street is another bank, the "London, City, and Midland," at the corner of Bond-street. It is also of stone. The main ground and story has an order of columns (Doric) resting on a stylobate of grey granite. There is a corner granite doorway with pediment, and above is a recessed circular turret crowned by a lead cupola. The turret has two engaged columns, and is well treated in the design.

The recently-built Free Public Library next the Dome is designed in the style of the Pavilion. The entrance-hall is lined with ceramic glazed tiles in shades of light green, with an ornamental dado in dark blue and green, the stairs being separated by an archway of cusped arches of the type seen at the Royal Pavilion, supported on capitals of the same Moorish or Indian style. The news-room on the ground floor is well lighted by large windows facing Church-street. The lending-library is also a spacious room of considerable length, top-lighted by a lantern skylight. Above the news-room is the reference-room, the ceiling of which is panelled with three small cupolas of tinted glass, which give a soft subdued light. The pavilion at the end of the new Palace Pier, (which is about 1,700ft. in length) is a spacious structure of its kind. The auditorium is covered by a bold segmental roof springing from small cantilevers which project over the side passages. It is divided by large and small ribs with longitudinal timbers or purlins, which form deep coffers. These are stencilled, and the scheme of colour—deep red, blue, and green—is effective. Along the crown of roof the coffers form a series of open lights. The hall is well ventilated by exhausts along this level, and the seating is in curved rows, and is inclined from platform of orchestra to the back of hall. The ribs are plain and rectangular in section, but have painted ornaments in the sides and soffits. The cut cusped brackets are also painted. The design and decoration are noticeable chiefly for the employment of a mechanical method, the circular cusps of cantilevers which are repeated in the archeding between the side pillars. These arcades of cusplings are made of pieces of wood turned to the same curvature, so that the design is a repetition of arcs of circles, and the decoration is also a good example of stencilled patterns and frets applied to pillars, ribs, and coffers of roof.

The sea-walls and promenades of the Brighton Front are probably as extensive

as any in the kingdom. The massive concrete groynes which protect the beach from the ravages of the sea have well answered their purpose, and even the great storm of September 10 last week—a record storm, which will not soon be forgotten—has not done any considerable damage to these useful breakwaters. To show the violence of the waves on this occasion, we may mention that, in spite of the protection afforded by the groynes, on one portion of the front, between the two piers, the concrete and asphalt parade was undermined and broken away for a considerable distance; and Volk's Electric Railway, which now runs partly on the shore and partly on a timber viaduct above the beach, was undermined near Kemp Town; the concrete and ballast have been washed away from below the metals, leaving them suspended in places. But much greater havoc would have resulted to the beach and lower parades had not the concrete groynes and walls been constructed, and the municipal authorities of both Brighton and Hove deserve the best thanks of the inhabitants and of all visitors for their efforts to render the great sea-frontage—the King's-road—worthy of its reputation as one of the longest and best in the kingdom. There is much to interest the architectural tourist in the heart of rural Sussex. There is Cuckfield, possessing two fine examples of the domestic architecture of Elizabeth and James I. Cuckfield Park House is a stately mansion in a shaped in plan, though much restored and altered, so that its earlier form is obscured, and with exquisite wainscoting to the walls and noble fireplaces; and there is Oakenden, perhaps better known. Cuckfield Church is particularly interesting in its architectural details and monuments, and there is Slaughman Church, Slaughman Place, and other examples visited only the other day by the Sussex Archeological Society; but on these beautiful old houses and churches, romantic in their surroundings, we have no space to descant.

THE BRITISH ASSOCIATION AT SOUTHPORT.

THE second visit of the British Association to Southport, after an interval of twenty years, which has taken place during the past week, has not been characterised by any outstanding features of interest, and the attendance of members has been much below the average, less than two thousand tickets of admission having been issued. Sir Norman Lockyer, instead of devoting his presidential address to spectrum analysis, the observation of the sunspots, or some other phase of quasi-astronomical investigation usually associated with his name, made an appeal to the British Government for twenty-four millions for the endowment of at least eight new universities—a cool request to which the long-suffering taxpayer will not very readily respond!

In accordance with our usual custom, we notice a few of the papers read of special interest to our readers. A fuller report of the proceedings appears in the current issue of the *English Mechanic and World of Science*.

THE COMMERCIAL AND MILITARY IMPORTANCE OF GEOLOGY.

In his presidential address to the Section of Geology, Professor W. W. Watts, secretary of the Geological Society, considered the practical uses of such training in getting a topographical knowledge of a country—instancing the recent war in South Africa—which might be of immense military value. He also dealt with the importance of geological knowledge in connection with all economic questions relating to the mineral wealth of the Empire, especially in respect of the coming exhaustion of our present coalfields, and the paramount necessity of correct and accurate scientific knowledge of these new and deeper strata which will then have to be worked, and in conclusion urged the necessity for the study of geological maps and the more general teaching of economic geology.

WATER SUPPLY FOR TOWNS.

Mr. Charles Hawkesley, past-president of the Institute of Civil Engineers, stated that the

advances in recent years in chemical science, and the application of the science of bacteriology to the examination of water, had led to the condemnation of water which a few years ago would have been deemed to be perfectly suitable for a town supply. Whilst fully appreciating the advantages to be derived from the most careful examination of water supplied for domestic consumption, he thought that people were sometimes unnecessarily alarmed by the results obtained. Taking a broad view of the subject, and looking to the healthy condition of towns which for many years had been supplied with water from sources now regarded with suspicion, he thought that the teachings of chemistry and bacteriology were as yet but imperfectly understood. A Royal Commission recently recommended that a Government department be established, and endowed with enormous powers of interference with the action and discretion of the bodies entrusted by Parliament with the responsibility of the administration of water supplies; but it behoved these bodies to give careful consideration to the recommendations, and to take the necessary steps to check any attempts to give effect to proposals involving vast, and perhaps needless, expenditure.

AFFORESTATION AROUND RESERVOIRS.

Mr. Joseph Barry, M.Inst.C.E., engineer-in-chief of the Liverpool Waterworks, read a paper on afforestation of waterworks catchment area. He alluded to the fact that municipalities had of late taken to the purchase of land around their reservoirs, so as to better secure the purity of their water supplies. Over 100,000 acres had been thus secured by English municipalities, and the question now arose, how were those areas to be utilised? In order to reduce to a minimum the risks of polluting the water in a manner likely to produce disease, the first object must be to reduce the resident population to the lowest practicable limit. In considering the desirability of afforesting the gathering ground of waterworks, it must not be assumed that the proposition was to cover the entire area with trees. Questions of aspect, temperature, depth of soil, wind, rain, and frost, and other features, must be taken into account in determining where and what to plant. It was probable that the proportion of any gathering ground that could be planted with advantage would be found to vary from 25 to 75 per cent of the total. On those points it would be necessary to obtain competent expert advice, so as to avoid imprudent expenditure and to guard against failure. Mr. Parry explained in detail what had been done in the way of afforestation by the Liverpool Corporation at their Vyrnwy watershed in North Wales. Sir Bosdin Leech gave some information as to what had been done by the Manchester Corporation in the way of afforesting the watersheds from which the city's water supply is drawn, and expressed the hope that other corporations would follow the example of Liverpool and Manchester.

GARDEN CITIES.

Mr. Harold E. Moore, in his paper read in this section on "The First Garden City: its Future and Economic Results," said many who considered favourably the proposals of Mr. Howard and other speakers on "Garden Cities" were of opinion that the economic difficulties in their foundation were insurmountable. This question was now considered, as a site had been selected for the first of such cities. The site chosen, which would be in the possession of the Garden City Company from Michaelmas, comprised about 4,000 acres, coming to within one mile of the town of Hitchin and about 36 miles from London. The company would, doubtless, immediately erect a railway station in the centre of the estate, two and a half miles from Hitchin, make roads giving access to that station, erect and fit a cement factory, open a chalk pit, equip gravel pits, and do other work which would render available the natural resources of the estate. The total cost would then, probably, be about £180,000. This would be an average of about £30 an acre for the land, excluding the buildings and works at a reasonable value. Two different courses of procedure would then be possible. The first method was to lay out a model town with avenues and parks, and spend large capital in engineering works and buildings. It was suggested that this proceeding would result in failure. It would necessitate a large unproductive capital expenditure, cause annual expense in maintenance, involve serious financial risks, and reduce the present agricultural rental and value. The second method would be to attract

residents on small areas by offering sites with existing frontages at a rent-charge, and also to encourage manufacturers to take land by giving them sites on that part of the estate suitable for manufacturing purposes on condition that they took further areas at a rent-charge for the erection of cottages for their workpeople; these cottages to be erected by the manufacturer, the intending occupier, or by builders who conform to the stipulated "Garden City" regulations. It was suggested that this method would confer all the advantages claimed for "Garden Cities" with satisfactory economic results. The rent-charge, even in respect of the most outlying land, would reasonably be not less than 50 per cent. in excess of present rentals, while for building sites the rent-charge would be many times larger. The increased value secured by this increased rental without risk might then soon justify expenditure of capital on various town developments and improvements.

EXPENDITURE UPON HOUSING.

In the words of an able paper on the "Wealth of the Empire," read in the Economic Section by Sir Robert Giffen, the author dealt with the individual expenditure upon housing. The sum was very large, and probably in various directions, by individuals and classes, perhaps so much was spent that there was considerable economic waste; but for the mass of the people, the housing arrangements were not sufficient for civilised life, or even for good health. Great as the increase in this item had been since the report of 20 years ago—the expenditure being about double what it was then, with an increase of less than one-fourth in the population—they must look for further outlay in this direction as the wealth of the people increased, and the increase of accommodation had probably not been quite proportionate to the increase of expense. While our food bill had been lightened by the fall in prices, the expense of housing had been greatly increased, among other causes by the rise of rent in the neighbourhood of large towns through the steady growth of population and the monopoly value thus given to areas suitable for building. The expense of building had also been increased by the advance of wages in the building trades; but whether this advance was not largely balanced by a fall in materials, or the substitution of different materials, was not quite so clear. At any rate, there seems to be no doubt about the rise in rent, and the permanent causes of that rise, which certainly added to the complexity of the problem of the housing of the people.

RESISTANCE OF ROAD VEHICLES TO TRACTION.

The report of the committee appointed to consider the question of the resistance of road vehicles to traction, of which Sir John Thorneycroft is chairman and Professor H. S. Hele-Shaw secretary, was submitted to the Engineering Section. The report described experiments made with various kinds of tires on different descriptions of roadway and at varying velocities of travel. With iron tires on a roadway paved with setts 6in. by 3in., having a regular but fairly rough surface, and with a 1in. gap between the joints, experiments were made with a lorry wheel 40in. in diameter having a 3in. iron tire slightly rounded in section. By diagrams exhibited the rate of increase of tractive effort was shown to diminish with the velocity. The report attributed this suggestive fact to the circumstance that as the wheel travelled faster it had less time to fall into the little hollows in the roadway, merely skimming along the tops of ridges. The diagrams showed that with a load of 392lb. on the wheel, and at a speed of about 7½ miles an hour, the tractive effort needed was about 21lb. to 22lb. This power increased until at about 13½ miles per hour the tractive effort was a little over 26lb. Taking the highest curve in the diagram, which represented a load of about 952lb., it was shown that at about 8½ miles per hour the tractive effort was about 38lb. to 39lb. The power acquired increased until at 12 miles per hour the tractive effort was 50lb. With the higher load, therefore, the curve was very much steeper than with the lower load. Experiments with pneumatic tires were next dealt with in the report. A wire-spoked wheel 24in. in diameter and having a 2½in. tire was tried on a level stretch of macadam road in fairly good condition, but slightly gone in places. With a load of 315lb., and at a trifle over six miles an hour, the tractive effort was just under 20lb. Increase of speed brought a comparatively small addition to the effort needed to turn the wheel, for at

about 15½ miles per hour the tractive effort was registered at only about 21lb. more, approximately 21½lb. Again, with the heavier load the curve was steeper: for at 65lb., and at about 6½ miles per hour, the tractive effort was about 37lb., whilst at 15½ miles per hour the tractive effort was about 41lb. The difference between a light and heavy load was thus not so strongly emphasised as in the case of the iron tire. Experiments had also been made on wheels for heavy traffic. The conclusion arrived at was that, for heavy traffic wheels, tires of more than about 9in. in width had, in practice, little material value as tending to reduce road resistance or damage to the road surface. The report suggested that experiments might be carried out with the view to testing the accuracy of this conclusion. The theory was submitted that the supporting power of a road was limited by the cohesive friction of the road particles against each other. This supporting power—limit varied considerably according to the material and the moisture absorbed. These points were advanced by Mr. Diplock, a member of the committee, and he urged the committee to take steps to ascertain the maximum useful width of tire for heavy traffic, the limit of weight on each wheel up to which road resistance increased in direct approximate proportion to the increase of weight on each wheel, and the rate of increased road resistance when that limit was moderately exceeded.

PROBLEMS OF MODERN STREET TRAFFIC.

Lieutenant-Colonel Crompton, R.E., read a paper on this topic, in which he pointed out that, in spite of the large increase of improved means of communication, the average speed of travel in large cities amounted to about five miles an hour. This was due to the congestion of all those means of communication increasing in even greater ratio than the improvements in traction. In order to quicken the enormous existing wheeled and walking traffic, the author advised the establishment of a department of the police to take charge of the street traffic. Such a department could be the expert authority to determine what classes of vehicles were fit and proper to be used in the public streets and to advise local authorities and Parliament as to by-laws and regulations, and upon street widenings, improved crossings, new railways, subways, and tramways. In order that a street might accommodate the maximum number of vehicles it was necessary that these should be driven in parallel lines as close to the kerb as possible. In a 40ft. street it would be better to confine traffic in each direction close to the kerb, the remaining space being reserved entirely for overtaking and not to be encroached upon by opposing traffic. A table showing the number of passengers that could be conveyed along one road per hour in one line of omnibuses, each holding 26 passengers, and at varying speeds, clearly demonstrated the advantage of high speed and powerful brakes in preventing obstruction in the traffic. At three miles per hour, with an interval of 25ft. between omnibuses, 16,473 passengers would be conveyed per hour, but at twelve miles per hour the number would be 65,892. On the other hand, with an interval of 200ft. between vehicles at three miles per hour 2,050 passengers would be carried; at a speed of 12 miles per hour, with the same interval, 8,236 passengers would be conveyed. With motor omnibuses driven at 12 miles an hour at a 2-sec. time interval, nearly 33,000 passengers could be carried per hour. The author was of opinion that there should be no limit put to speed, especially in towns, other than that the vehicles should always be completely under control. An automobile vehicle at 12 miles an hour could be pulled up in less space than a fully-loaded omnibus running at an average of seven miles an hour. Accelerating and controlling power was given in a high degree by the electric automobile, which the author described as the vehicle of future town traffic. The steam-driven vehicle, however, had also the quality of control to some extent in common with the electrical vehicle. The petrol-driven vehicle was not so advantageous in this respect. Finally, the author dealt with walking traffic. With certain exceptions foot passengers should only be in the roadway at their own risk and peril, the exceptions being that they might cross the road at places marked by notices. In very busy thoroughfares subways or bridges should be provided.

THE PURITY OF WATER SUPPLIES.

In his inaugural address as president of the Zoological Section, Professor Sidney J. Hickson



OLD HOUSE, SWAN HILL, SHREWSBURY.

remarked that the growth of great cities and the improvement in their ideas of sanitation, had brought forward as important problems for consideration the purity of the water supply and the disposal of sewage. The municipal authorities at last realised that those problems could only be satisfactorily met by elaborate scientific investigation, and they had found that it was not only desirable for sanitary reasons, but also profitable, to call in men of science for consultation and advice. At present, however, those problems were approached from only two points of view, the chemical and bacteriological, the effects of other organisms than bacteria upon the character of the sewage effluent and the purity of water for drinking purposes being, so far as he had observed, neglected. In this connection he mentioned two cases which had come under his notice to show the kind of work which might be done. Some years ago the water of Burnley gave off an offensive smell, which was traced to the Hecknest reservoir, where the common water-snail, *Limnaea peregina*, was present in enormous numbers. A trained zoologist was consulted, and his recommendations led to the abatement of the nuisance at a minimum cost. Two years ago the chairman of the Manchester Corporation Water Committee reported the partial choking of the mains by the growth of what he called a "moss," of which no less than 700 tons had been removed by a laborious and expensive process. It was scarcely necessary to say that the organism was not a moss; it was probably not even a vegetable, but an animal belonging to the genera of fresh water polyzoa, but, so far as he was aware, no steps were taken to identify the organism, and no investigations were made to discover its origin, or to prevent the return of the trouble in the future. The fact was, their ignorance of the general balance of animal and vegetable life in the large reservoirs was profound, and a systematic inquiry conducted by competent persons would most certainly lead to knowledge which would be of great scientific importance, and, in the long run, remunerative to the community.

SHREWSBURY SKETCHES.

THIS year being the 500th anniversary of the Battle of Shrewsbury, the old town has received rather more prominent notice than usual, so that a few sketches may be appreciated by those interested in this ancient and historical borough.

No. 1, White Hall, a fine old mansion which stands in its own grounds near the Abbey Church, is a splendid specimen of Tudor architecture, being built in Elizabeth's reign by one

Richard Prince, a rich lawyer and courtier. It is constructed of red freestone, similar to that of the old abbey; but, unfortunately, the building has years ago been whitewashed, probably that its name may not be a misnomer. It has since, however, undergone a process of raddling, and although it now more resembles its original colour, the freestone has lost the rich hues which add so much to the beauty of the Abbey Church and the Castle.

The Gatehouse, No. 2, which has a frontage to Monkmoor-street, is a very interesting structure, and still retains the original studded oaken door.

The Half-Timbered House in Swan Hill, No. 3, is dated 1628. It is in an excellent state of



No 5

GABLES IN OLD INN YARD, SHREWSBURY.

preservation, and the porch, which has richly-carved brackets, forms a very pleasing feature.

Ireland's Mansion, No. 4, standing as it does in one of the principal streets, is more widely known than the house above referred to. It is a magnificent edifice, and was originally the town house of the Irelands of Albrighton, an old county family.

The Ancient Innyard, No. 5, surrounded as it is with dilapidated, though picturesque, gabled buildings, is entered by one of the quaint gateways so characteristic of the inns of this date. The brick gables which are seen to the left of

the sketch belong to Rowley's Mansion, said traditionally to have been the first brick building in Shrewsbury, having been erected by William Rowley, an Alderman of the Borough, early in the 17th century. It has been stripped of all its embellishments, and has for many years been used as a warehouse.

Golden Cross Passage, No. 6, is another of Shrewsbury's odd nooks. Here a pretty peep is obtained of the tower of St. Julian's Church.

REGINALD M. CORNALL.

POSSIBILITIES IN PHOTOGRAPHY.

"THE Linked Ring," as the members of the higher cult of photographers term themselves, have shown once more the limit to which the legitimate use of the camera can go in the art of picture and portrait making. The display of prints opened this week in the Dudley Gallery, Piccadilly, under the auspices of the Photographic Salon, again makes the restrictions of the process unquestionably evident, though the manifest aim of many of the exhibitors has been to render their photographs as little like photographs as possible, so that it is not easy to determine where the mechanical process ends and manipulation commences. The result, however this may be, is not artistic, whatever the skill and ability of the manipulator in endeavouring to imitate line or brush work by photography. The capabilities of the camera, aided by artistic comprehensiveness in the management of light and shade, are, of course, very considerable, and there is a great variety of thoughtful and artistic photography within the walls of the Salon this year; but we turn to these to show us the possibilities of the art rather than to the productions of more ambitious exhibitors, whose endeavours to reach the character and charm of the water-colour painter in monochrome are only destined to failure by assuming to be what they are not. At least the Linked Ring brotherhood deserves the credit of breaking away from the mechanical side of photography, and some of the members of the Salon rank amongst the most capable photographers of the time. Anyone who uses the camera would do well to see the exhibition, and to any of our readers who should pay the gallery a visit we would advise them to note a few points which attracted our attention. Possibly some little allowances should be made in this respect of preference in our choice of architectural subjects—and it is quite likely that, from a technical point of view, photographically speaking, we may have overlooked some notable triumph. Most of our readers, however, who do anything with the camera, find quite enough scope for its use in selecting buildings for their subjects. To anyone who does so let them look at the exquisitely-rendered and sympathetic view (223, by Mr. Walter Seutt) of "La Rue aux Fèvres, Lisieux"—that delightful old street of timbered gables and overhanging fronts of Gothic woodwork, so familiar to the lover of the picturesque. The photographer, while keeping to his legitimate sphere, has produced a charming study, soft and bright in the shadows, perfectly true to nature. Mounted on a greenish-grey mount in a plain little bead oak frame, this warmly-coloured study takes a lot of beating, small as it is. Mr. Frederick H. Evans shows less departure still from the ordinary use of the camera, but his prints are eminently pictures, enabling one to enjoy what they so beautifully show. Having spent some hours only the other day in visiting York Minster, we can all the better appreciate Mr. Evans's "Patch of Sunlight" (No. 151), giving a view of the double tracery and mullioned famous east window of the choir with its grand historic glass. The name of the print is due to a flick of light which appears on one of the aisle piers. The same photographer gives equally good views from Ely Cathedral, 50, 51, and 120, the last rendering being a fine study of the high light coming in by an open door with the reflected effect on the architecture of the interior. Mr. Walter Bennington's north-east view of St. Paul's Cathedral shows in a broad misty effect the outline of the cupola and western towers of Wren's masterpiece (83). Mr. Eastace Calland exhibits some diapered prints on woven stuffs of autumn flowers (5 and 15), which are intended for the ornamentation of hook-covers. The present examples scarcely, however, go beyond the limit of a suggestion. Mr. A. Horsley Hinton triumphs in photographic landscapes, and among his four (31, 182, 183, and 186) we like the first, called "Gorse," the best as a

bright and well-toned picture in which relative values are maintained. The others are very diverse in subject, but all in one respect agree—their lack of luminosity. Mr. Reginald Craigie's portrait of Mr. Hermann Vezin (42) is a fine study concentrated on the face of the sitter. Another good portrait is by Mr. Harold Baker, of Mr. Catterson Smith, the new head master of Birmingham School of Art (121), shown in profile. Mr. Fred Hollyer is represented by a notable photograph in his best style of Mr. E. W. Hornung (153), for which we have nothing but praise; and near it hangs a well-modelled photograph of a portrait study (14) of a man by Mr. F. H. Evans, showing that he is not limited to architectural subjects by any means. Miss Constance Ellis's "Extenuating Circumstances," in a legitimate use of photography, shows a group in an old-fashioned window—a mother and child, with an old man, presumably a curé, admonishing the little sinner (147). As to Miss Mabel Jennings's Indian ink and white studies of "Pierrot" (176) and "A Poster" (178), they have nothing in common with photography, and possess little art to recommend them otherwise. "Sunshine After Rain" (60), by Mr. Ward Muir, is another faked-up print, with high lights coarsely put in to get a water-colour paper effect. "Peg" (46), a girl with dog, makes a pleasing attempt at a washed-drawing mannerism which is best avoided under such conditions. "The Court of Directors of the Bank of England, 1903," by Mr. Reginald Craigie (22), is a capital example of the best type of interior photography, giving excellent portraits in a straightforward and artistic way well within the limits of capable camera work.

KING'S COLLEGE, LONDON: ARCHITECTURAL DIVISION.

THE Division of Architecture, which was separately constituted a year ago, will resume work on October 1, when the various courses of lectures and the studio for day students will be opened. A feature of the past session has been a visit paid by the students for measuring and sketching to Oxford, and it is intended to arrange a similar week's visit to some centre of architectural interest during the Easter vacation of the new session.

The evening lectures and the studio for evening students, supported by the Carpenters' Company, will open on Monday, September 28, when there will be a short opening lecture by the Professor, and new students can be enrolled. The evening fees have been somewhat reduced in most of the evening classes, and the Carpenters' Company are prepared to grant nominations to deserving students as in previous years.

ARCHITECTURE IN WOOD AND HALF-TIMBER.

GERMAN enterprise in the production of technical books finds a vastly larger encouragement at home than can in the ordinary course be said to be accorded to English books of a like class in England. This difference is, naturally enough, due to the vast number of State-aided and other colleges and technical schools in Germany. However this may be, foreign publishers are constantly issuing admirable textbooks on architecture and building subjects. The best photographic works on contemporary British buildings have been issued in Germany, with plans and particulars furnished evidently by the architects themselves. We have now before us the first two parts of a comprehensive and copiously illustrated work published in Berlin under the editorship of Professor Constantin Uhde, by Mr. Ernst Wasmuth, giving a graphic history of the construction and ornamentation of buildings from the earliest times in various countries. The book will be completed in four parts. Several of its illustrations are chosen from English publications, the *BUILDING NEWS* among the series, and there are many photographs from blocks with the letter-press printed in very good style. Some of the detailed diagrams are suggestive and useful as typical examples, notably those of the old houses in Brunswick, specially the illustrations showing the development of wooden buildings, leading up to stone architecture. The Swiss work, too, is ingenious, of course, and always interesting. The timber log houses of Norway are represented by some new photographs, a few being interiors. The com-

pilation of English timber work includes the Greyfriars Hospital at Coventry, shops Batchers, Shrewsbury, Moreton Old Hall, several fronts from Chester, and some good English roofs, old and also modern ones, though the illustrations vary in merit according to the source from which they are reproduced. Reprints of old lithographs do not go very well by the side of contemporary pen sketches and photographic pictures, so that the volume in this respect lacks the appearance of uniform thoroughness as a specimen of bibliography. The blocks on some of the pages are put the wrong way round for convenience of reference reading, from the left instead of from the right hand. Lintel and beam construction is traced through Persian chronology, the Theban Period of Egypt, and the Assyrian Palaces, the masterpieces of Greece and the triumphs of Rome, down from prehistoric days. In these two parts there are over five hundred illustrations. Spain and Italy are well represented, including some examples of arched and stone design. The title of the work is "Die Konstruktionen und die Kunstformen der Architektur," and the parts are issued in paper covers.

TIMBER TESTS.

THE Bureau of Forestry of the United States Department of Agriculture intends to resume the work of testing timber. The Bureau aims at practical results, such as the values expressing the strength and stiffness of the principal species of timber. These will be ascertained, not only for timber now in use, but for those not largely used, such as the Southern gums, Western hemlock, also for red fir, such as Oregon pine or Douglas spruce. The discussion on these tests at the Annual Convention of American Civil Engineers held during last June was instructive on many points. Mr. W. R. Hatt, Assoc. M. Am. C. E., refers to various technological processes. As to kiln-drying, it was found that, "for any temperature commonly used in drying timber no detrimental effect on the timber would be produced, aside from the checking action which might result from too rapid drying of the exterior portion of the stick. The effect of very high temperatures and pressures used in drying, as in the vulcanising process, is, according to former Government tests, to reduce the strength slightly." Further investigations are proposed to discover the best conditions for the prevention of "checking" methods of seasoning. The effect of bleeding long-leaf pine for turpentine is not detrimental to its strength, according to previous Government tests, and these are thought to be conclusive, and will not again be made; but we should think this "bleeding" would be distinctly prejudicial to the durability of timber, and further tests are to be made to find out this. The effects of fire-retardants on timber and their efficiency for various species are to be investigated, also their effects on nails and fastenings. The variations in timber are also important in making tests. The results of those on large sticks are lower than those obtained from smaller sections. Among the properties to be determined are the mechanical properties of species, such as strength, stiffness, resilience, hardness, and physical properties like shrinkage, swelling, and absorptiveness, identification by structure, and identification by appearance of sawn lumber. It is proposed to determine properties of structural timber in the market of the actual sizes, so as to determine moduli for design; to determine the value of woods considered inferior, the liability to knots and the reducing factors due to these; standards of weight for tabular use. Referring to preservative processes, Mr. Von Schrenk says: "Tests as to the direct influence of the preservative or the strength of various classes of timber should be conducted, as far as possible, with the exclusion of such factors as have been mentioned above. In other words, in testing the influence of zinc chloride on timber, all timbers tested should be subjected to a similar amount of steaming, kiln drying, or air seasoning, so that the only factor to be considered would be the impregnation of the chloride. Tests to determine the influence of preservatives on the timber should consider the use of the preservative in varying quantities, for it is entirely possible that a preservative used up to a certain strength does not weaken the timber, while excessive use may weaken it considerably. The following preservative processes should be included in any series of tests. 1. Zinc chloride. 2. Creosote or

tar-oil and its various forms, such as spiritine, carbolineum, &c. 3. A combination of zinc chloride and creosote. 4. Hassellmann or Barschall treatment. 5. The electrical process of timber treatment, using magnesium sulphate. 6. The Ferrell process, using various salts. 7. The creosote-resin process." The variable strength factor found in untreated wood should be eliminated in making comparative strength tests. The method of achieving this is to saw the given log into two pieces—one half is treated, and the other is untreated. The results, after the two halves were tested, eliminated this valuable factor, because the two pieces came from the same tree. The discussion, as given in the *Proceedings* of the American Society of Civil Engineers, is very important, and comprises many theories and suggestions of considerable practical value. A series of tests as proposed would enable the engineer and architect to compute the strength of timber with much more certainty.

A SANITARY CRUSADE ROUND THE WORLD.

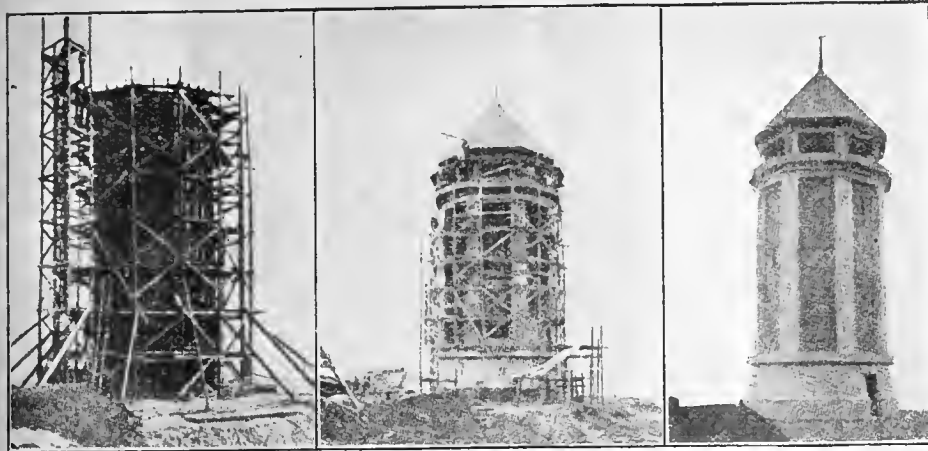
MR. ROBERT BOYLE, of Messrs. Robert Boyle and Son, the well-known ventilating engineers, of London and Glasgow, has recently returned from what constitutes his eighth sanitary crusade round the world, he having circled the globe that number of times, preaching the gospel of pure air, and advocating the adoption of hygienic measures that would tend to secure the better health and consequent welfare of the peoples of the many countries he has visited from "China to Peru," Mr. Boyle having on one of his crusades travelled through China to its most remote boundaries, and last year the West Indies and South America.

Mr. Boyle is a practical as well as a scientific exponent of the laws of health, having devoted his whole life to the cause, and among the many benefits he has conferred on humanity as a pioneer in sanitary reform may be mentioned the £100,000 gift he made last year, on the occasion of his Majesty's Coronation, for the purpose of promoting the teaching of hygiene in the schools and colleges of the Empire, and inculcating the benefits to be derived from breathing pure air, and so make a strong and healthy people, and a strong and healthy Empire.

A CONCRETE-STEEL WATER TOWER NEAR BOSTON, MASS.

FORT REVERE is one of the fortifications which command the entrance to Boston Harbour. It is situated on a hill in the town of Hull. About one year ago the U.S. War Department advertised for bids for a steel standpipe inclosed in masonry tower for the water supply of this post; but bidders were permitted to submit proposals for other kinds of construction, provided their proposals were accompanied by plans and specifications setting forth clearly the character of the structure offered. Among the tenders received was one for a standpipe and tower of Henssliques armoured concrete construction, and, as this bid was some 30 per cent. lower than any other, it was accepted. The tower has recently been completed, and so far has proved perfectly satisfactory in service. There are a few tanks and standpipes of this type of construction in Europe; but it is claimed that this is the only one in the United States.

In the plans for the concrete structure the general idea of the tower remained the same as in the plans prepared by the United States engineers, but the steel standpipe was replaced by one of armoured concrete, and the octagonal inclosing tower was constructed with armoured concrete pillars and intermediate brick panels on a concrete base. The combination of these two materials makes a pleasing appearance, as the buff brick panels harmonise well with the grey colour of the concrete pillars and the base. The use of armoured concrete for the tower made it possible to reduce the thickness of the pillars which, if built of masonry, would necessarily have been of large dimensions in order to resist the wind pressure, since the tower is in an exposed position and the winds from the Hull Hills frequently blow at the rate of from 30 to 40 miles per hour. The foundations are of massive concrete, in which, beneath the centre of the standpipe, a gate chamber is formed from which a pip gallery extends to one side of the tower. Access is had to this chamber through a trap door by means of a ladder.



Fort Revere Concrete-Steel Water Tower: Three Stages of Construction.

The steep pyramidal roof remains substantially as originally designed, and has a heavy wooden frame covered with lin. boards and black slate. The total height of the tower above the ground is about 93ft. to the top of the finial, and the foundations are about 5ft. deep. The story immediately under the roof is arranged as an observatory, and is reached by a concrete-steel spiral stairway in the 2ft. space between the standpipe and the inside of the tower walls. The stairway is lighted by several windows piercing the brick panels of the walls. The observatory floor is 2ft. in the clear above the top of the standpipe, of concrete-steel construction 3in. thick, and supported by two reinforced concrete beams 6in. wide

shown by some of the drawings and described below, and its inside surface was coated with a watertight finish 1in. thick of 1:1 Portland cement mortar. When filled with water, there is no appreciable percolation, which testifies to the watertight qualities of cement construction when properly handled.

The bottom of the standpipe is 4in. thick, including the 1in. watertight mortar coating, and is reinforced with two layers of $\frac{1}{2}$ in. round bars placed at right angles to each other with the bars in each layer spaced 4in. apart and arranged as shown in the detail drawing. The ends of each bar are turned up about 1ft. into the wall. The junction of the bottom and wall is reinforced

with welded joints in the lower two-thirds of the height of the standpipe, and of $\frac{1}{2}$ in. round bars with wire-wound lap joints for the upper one-third. The vertical spacing of the hoops increases from the bottom upwards. For the $\frac{1}{2}$ in. hoops there are 23 $\frac{1}{2}$ in. spaces, 41 2in., 34 $\frac{1}{2}$ in., 22 3in., 13 $\frac{1}{2}$ in., and 23 $\frac{1}{2}$ in. For the $\frac{1}{2}$ in. hoops there are 9 3in. spaces, 6 $\frac{1}{2}$ in., and 6 $\frac{1}{2}$ in., the inner and outer hoops at each level up to this elevation being in the same horizontal plane. For the remaining 16ft. the two sets of hoops are staggered, the vertical distances between the successive inner and outer hoops increasing from 2in. to $\frac{1}{2}$ in.—that is, the hoops in each set are spaced from 4in. to 15in. apart. The ends of the bars in all parts of the work, excepting the hoops, of course, are split and spread slightly to afford a better grip in the concrete. The outside of the standpipe has a $\frac{1}{2}$ in. coat of Portland cement plaster and is whitewashed.

The three views present different stages in the progress of construction. The first view shows the interior mould for the standpipe, the staging, the elevator tower for handling materials and the placing of the steel armature. The second view was taken during the construction of the brick panels, and the third shows the finished tower. American Portland cement was used throughout. The concrete was mixed in the proportions of 1:3:6 for the foundation, 1:2:5 for the tower, and 1:2:4 for the standpipe. The sizes of broken stone used were $\frac{1}{2}$ in. for foundations, basement, and pillars, and $\frac{1}{2}$ in. for the standpipe and the observatory floor.

The tower was erected under the direction of Capt. Alfred M. Palmer, depot quartermaster, by Mr. R. Baffrey, manager for the Hennebique patents, 1123, Broadway, New York City, as general contractor.—*Engineering Record*.

CHIPS.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made by them for the construction of light railways in Southend-on-Sea and the Shoeburyness district.

The town council of Bolton agree at their last meeting to raise the salary of Mr. Morgan, the borough engineer, from £700 to £800 per annum.

A statue of the late Sir Thomas Elder has just been erected on the terrace in front of the Conservatoire of Music at the University of Adelaide, South Australia. The statue is of bronze, 9ft. in height, and rests on a pedestal of Aberdeen granite. It is by the well-known London sculptor, Mr. A. Drury, R.A. On the pedestal, which is 12ft. high, are four panels. The front one bears the inscription:—"Sir Thomas Elder, G.C.M.G., 1817-1897." The other panels, representing art, exploration, and benevolence, are designed to commemorate some of the works with which the name of Sir Thomas is prominently associated.

The Housing of the Poor Committee of the New-castle Corporation have recommended their council to proceed at once with the erection of workmen's dwellings on the Walker New-road Estate. There are to be 12 one-room dwellings and 52 two-room dwellings.

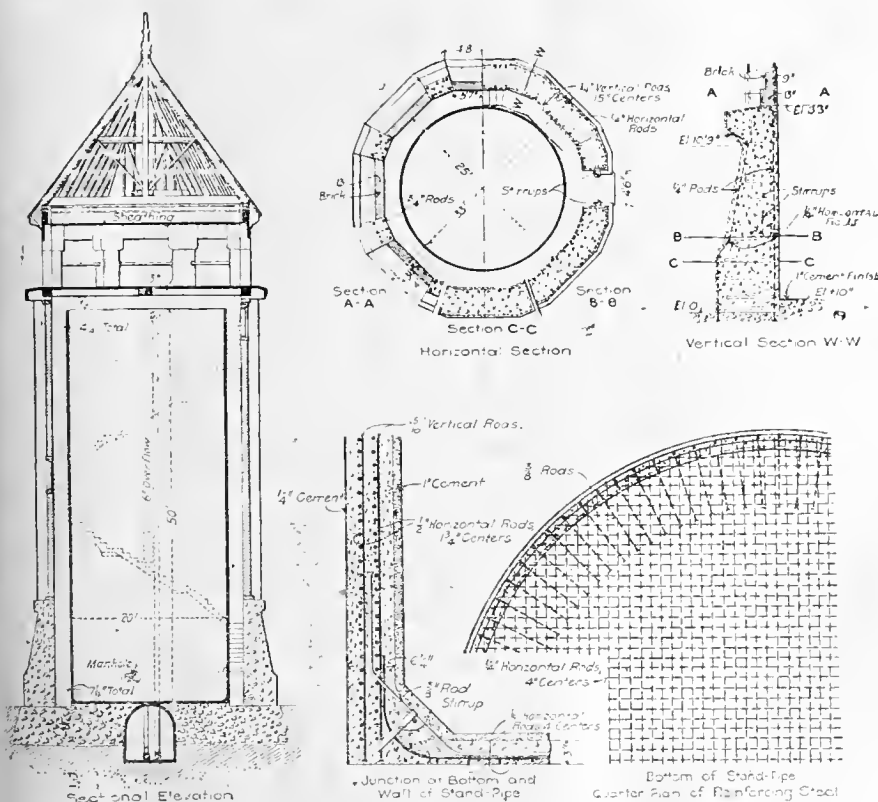
The ceremony of laying the foundation of the new church dedicated to St. Luke, at Newport, Mon., was performed last week. The new church will be erected on the site of a much smaller building, erected in 1857, and dedicated to St. Mark. It will be Early English in style, and will accommodate about 750 persons.

The Bridlington Town Council have decided to promote a Bill in Parliament empowering them to build a pavilion and other buildings on the proposed extension of the Royal Princes Parade. It has also been resolved to spend £2,100 on the erection of a pavilion round the new bandstand to accommodate about 2,000 persons.

At the meeting of the school board of the parish of Cathcart, which is practically a southern suburb of Glasgow, on Monday night, it was reported that sites had been secured in Albert-road, Langside, and Catkin-road, Langside, for the erection of two schools, each to accommodate 120 children, to meet the rapid growth of the population in that district.

The Bristol Watch Committee have received the approval of the Home Department to the plans for the new police-station for Brislington, which is to be erected near Bloomfield-road, at a cost of between £3,000 and £4,000. The building will include accommodation for fire-extinguishing appliances. Tenders will now be invited for the work.

The Local Government Board have given formal sanction to the borrowing by Boston Town Council of £14,220 to meet the cost of the Boston West sewage scheme.



Method of Reinforcing Concrete Steel Water Tower.

by 12in. deep, resting on pillars of the tower. This floor projects beyond the walls and forms a water table finished with a deep fascia. A section of the base of the tower, indicating the method of placing the steel reinforcements in it, is shown in one of the detail drawings. The exterior is blocked off in imitation of stonework.

The most interesting part of this structure, however, is the standpipe, which is 20ft. in inside diameter and 50ft. high. The wall is 6in. thick at the bottom and 3in. at the top, and resists a head of water 50ft. This wall is armoured, as

by additional $\frac{1}{2}$ in. round bars, bent as shown, anchored into the corner by stirrups 7in. long of 1in. by $\frac{1}{2}$ in. flat steel, and spaced 8in. apart. These bent bars extend about 20in. radially into the floor and rise about 2ft. in the wall.

The wall is reinforced with two systems of vertical $\frac{1}{2}$ in. round rods placed 2in. apart transversely and staggered, the bars in each system being spaced about 16in. apart circumferentially, and by two sets of horizontal hoops, each encircling one of the sets of the vertical rods. The horizontal hoops are made of $\frac{1}{2}$ in. round bars

OBITUARY.

The funeral of Mr. ISAAC GOULD, a well-known Leeds builder and contractor, who died on Tuesday week, at his residence, Westfield-terrace, Chapel-town, took place on Friday at Woodhouse Hill Cemetery, Hunslet. The funeral procession was joined at Hillridge-road by the workpeople employed by Isaac Gould, Limited, who marched in front of it until the cemetery was reached. Mr. Gould was a self-made man, having in early life been cashier and book-keeper to Messrs. Longley and Sons, builders, Hunslet, rising to be their confidential manager. After the death of the Longleys, he carried on the business for the widow of one of them until it was transferred to himself. He carried it on till his death, having been connected with it for over forty years. Among the many big contracts which the firm fulfilled were those for the Bishop's Palace, Wakefield; the new Asylum at Wakefield, the Standard Life Insurance Company's Buildings in Leeds, the last extension of Leeds Infirmary, and the repairing of Eecup Reservoir.

CHIPS.

We accidentally omitted to mention that we were indebted last week for the information on p. 333 about a Glasgow cold storage to our contemporary *Ice and Cold Storage*, and should like to add that architects not already familiar with this excellent monthly, published at 89, Farringdon-street, E.C., will always find therein valuable matter on the construction of cold stores and refrigerating appliances.

Mr. W. A. Ducat, a Local Government Board inspector, has held an inquiry into the application of the town council of Ealing to borrow £3,640 for the purchase of premises for the purposes of a technical school.

Considerable improvements are being carried out at the West Cliff, Cromer, for the Protection Commissioners. Messrs. Douglass and Arnold, of London, are the engineers, and the works will cost £1,700.

The Midland Railway Company have deposited plans with the General Works Committee of the Dewsbury Corporation, and with the Thornhill Urban District Council, for a bridge to cross the river Calder, this being in addition to the lofty viaduct which will pass over the stream as part of the Spen Valley line to Bradford. This bridge will have three spans of 11ft. each, be constructed of iron, the girders resting on four piers, two being in the river itself, and the width will be 30ft. from parapet to parapet.

The Great Northern Railway Co. have adopted a novel idea for relieving the dullness of the embankments in the cuttings on their main line. At Abbot's Ripton, between Huntingdon and Peterborough, patches of gorse grow on the high sloping banks, and an ingenious platelayer has, in his spare time, been cutting the little bushes into the shape of garden chairs, plants in pots, peacocks, dogs, and other birds and animals. The company now has men at work trimming the gorse or white thorn on the embankments into many fantastic forms.

The foundation-stones of a new church and schools in Station-road, Old Hill, in connection with the Strict Baptist denomination, were recently laid. The chapel will be capable of accommodating about 500 worshippers, the total cost being £1,400.

The King has sent £50 to the vicar of Grayne, near Rochester, towards the restoration of Grayne Church, Port Victoria. The church is of the 11th century; it was much damaged by a large fort put within a hundred yards of it in 1862, and is now being restored. The vicar has raised £1,100, but £700 more is needed, exclusive of the porch.

At last week's meeting of the Swansea Rural District Council three schemes were submitted for supplying Gorseinon and Pontardulais with water. The amended figures for the scheme were put forward by the surveyor as follows:—No. 1, £6,697; No. 2, £8,995; No. 3, £6,901. It was decided to adopt scheme No. 3, and the preparation of plans in detail will be proceeded with at once.

The death is reported from Boston, Mass., of Mr. Frederick Law Olmsted, the eminent American landscape painter.

The tender of Messrs. Strong and Moore for the laying-down of the permanent way for the Pietermaritzburg electric tramway system, at £16,856, has been accepted.

Duke-street Congregational Union Church, Leith, which for the past two months has been undergoing alterations, was reopened on Sunday. The interior has been completely modernised. Electric lighting has been installed throughout the building, and the arrangements for ventilation and heating have been brought up to date. The interior has also been painted, the roof being ivory white and the walls light terracotta. The alterations have cost £500.

COMPETITIONS.

LEITH.—At Monday's meeting of Leith Parish Council held on Monday night, it was moved that Mr. J. M. Johnston be appointed architect for the proposed new pothouse building at Seafield, he being the designer of the plan selected by the council. To this an amendment was proposed that the official appointment of the architect be delayed until the Local Government Board had sanctioned the plans. But the original motion was carried by twelve votes to five, and Mr. Johnston received the appointment.

OWEN JONES PRIZE.—This competition was instituted in 1878 by the Council of the Society of Arts, as trustees of the sum of £400, presented to them by the Owen Jones Memorial Committee, upon condition of their expending the interest thereof in prizes to "Students of the schools of art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded on the results of the annual competition of the Board of Education, South Kensington. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principles of Design" and a bronze medal. The following were the successful candidates:—James W. Blackburn, School of Art, Huddersfield, design for woven muslin; Edwin Moss, School of Art, Macclesfield, design for tile panel; Tom H. Bailey, School of Art, Macclesfield, design for furniture silk; Abram Goodman, School of Art, Leeds, design for cretonne; Louis C. Collier, School of Art, Nottingham, design for lace curtain; John Brown, Kent-road Art Class, Glasgow, design for printed velvet. The next award will be made in 1904, when six prizes will be offered for competition.

The Roman Catholic Pro-Cathedral Church of St. Andrew's, Dumfries, was reopened last week, after undergoing an extensive process of restoration. The panels behind the sanctuary have now been filled in with two large pictures, copies from the church of St. Gregory, Rome, representative of the flagellation and martyrdom of St. Andrew, and a third, an adaptation by Mr. G. McLellan Arnott, Dumfries, of which the subject is the adoration of the Virgin Mother by St. Andrew and St. Ninian. A new silver door for the tabernacle, enriched with deep incised work emblematic of the Last Supper, has been presented by an anonymous donor.

Mr. W. B. Woodhouse, A.M.I.Mech.E., A.M.I.E.E., has been appointed resident engineer to the Yorkshire Electric Power Co. Mr. Woodhouse has been with the Newcastle Electric Supply Co. since their pioneer power scheme was started.

The city council of Truro have decided that Messrs. Beesley, Son, and Nichols' alternative scheme for the interception and disposal of the sewage, at a cost not exceeding £21,400, be submitted to the Local Government Board for their sanction and approval.

At the town-hall, Tedmorden, on Thursday last week, Mr. W. O. E. Meade King, M.Inst.C.E., held an inquiry as to the Tedmorden Corporation's application for permission to borrow money for the purpose of sewerage and sewage disposal works. The corporation intend to spend an additional £10,543 on sewerage works. Previously borrowing powers had been obtained for £28,780, so that the works will cost £39,323, owing to a deviation from the original scheme and a diversion of the river Calder. Sanction was also asked for an extra £2,300 to be spent on the Walsden sewers. Mr. C. R. Peace, borough surveyor, gave evidence in support of the scheme.

On Thursday, the 10th inst., the president (Mr. Butler Wilson, F.R.I.B.A.) and council of the Leeds and Yorkshire Architectural Society entertained the members of the Library Association, who are holding their annual conference in Leeds, to a smoking concert at the Queen's Hotel, to meet the members of the Leeds Savage Club. Among those supporting Mr. Butler Wilson in the chair were the Lord Mayor of Leeds (Mr. John Ward), Professor Macneille Dixon (president of the Library Association), the Vicar of Leeds (Dr. Gibson), Sir W. H. Bailey, Lieut.-Col. Robinson, Mr. Edmund Bogg (chief of the Leeds Savage Club), the Rev. H. Egerton Leigh, Dr. Coleman, Mr. F. H. Barr, and Councillor S. A. Hirst.

A new Society of Artists, Painters, Sculptors, and Architects has been formed in Paris, under the presidency of M. Frantz-Jourdain, with the idea of holding an exhibition at the end of next month, and hereafter annually. All information may be obtained from M. Nicolas Groppeano, 33, Rue Bayen, Paris.

PROFESSIONAL AND TRADE SOCIETIES.

MUNICIPAL AND COUNTY ENGINEERS AND SURVEYORS.—About fifty members of the Incorporated Association of Municipal and County Engineers attended the home district meeting, held on Thursday and Friday at Hastings under the chairmanship of the President, Mr. Wm. Weaver, M.I.C.E., of Kensington. The proceedings were opened on Thursday with a reception by the Mayor of Hastings, who was accompanied by Mr. P. H. Palmer, the borough engineer, at whose invitation the visit was paid to the town. At the business meeting Mr. R. J. Thomas, hon. district secretary, was re-elected to that position. Papers were read by Mr. Palmer on "The Hastings Waterworks" and "The East Hill Water-Balance Lift." The afternoon was spent in visiting the municipal dust destructor, the East Hill lift, the Filsham pumping station and reservoirs at Newgate, and other places of interest. Friday morning was devoted to discussing the papers read the previous day, and in the afternoon a visit was paid to the Brede Valley waterworks in course of construction. The total cost of the works and of prospecting will amount to £145,000. The scheme will be completed in about twelve months. The corporation electric light works were also inspected.

NORTHERN ARCHITECTURAL ASSOCIATION.—The members of this association will hold an excursion meeting at Sunderland, to-morrow (Saturday) afternoon, and will visit the Higher Grade Junior School, and the Hylton-road Carsheds. The association's circular contains the following statement in reference to the former President, Mr. Glover (now of Windsor):—"Our very hearty thanks are due to our past President, Wm. Glover, Esq., F.R.I.B.A., for having so very kindly presented the association with £1,000 of Consols, invested in the names of the President and Hon. Secretary as trustees. Not less than one-quarter or more than one-half of this capital may be withdrawn at a future date towards the cost of a building for the association. The annual interest from the capital amount is to be used for our society's educational work. The hon. solicitor is kindly preparing the necessary trust deed. In due course fuller details in connection with this very generous and valuable gift will be laid before our first indoor meeting, when an opportunity for united and further thanks from the whole association will be sent to our benefactor and friend."

THE SOCIETY OF ARCHITECTS.—The "house list" of nominations for officers and council of the Society of Architects for the ensuing session is as follows:—President, †Walter W. Thomas, of Liverpool; vice-presidents, †A. E. Pridmore and *G. Gard Pye, both of London; honorary secretary, *Ellis Marsland, London; members of council (twelve): *R. G. Bare, London; G. E. Bond, Rochester; *F. W. Chancellor, M.A., Chelmsford; C. Cole, Exeter; *Wm. Cooper, Hastings; A. Currey, Jersey; *J. W. Dyson, Newcastle-on-Tyne; *H. E. Knight, London; J. C. Jackson, London; *F. W. Macey, London; *B. R. Tucker, London; and R. Frank Vallance, F.R.I.B.A., Mansfield. Honorary corresponding secretary, *W. R. Mallett, F.S.I. [An asterisk (*) denotes proposed re-election; a dagger (†) proposed change of office.] Additional nominations may be made by any three members who shall send in their nomination to the council before Oct. 1.

The memorial to the officers, non-commissioned officers, and men of the 1st Batt. Oxfordshire Light Infantry who fell in South Africa will be unveiled at Oxford to-morrow (Saturday) by the Bishop of Oxford at 3 p.m. The site of the memorial is by Magdalen Bridge.

President Eliot, of Harvard University, recently designated architecture as perhaps the most learned of the professions, on account of the variety and complexity of the subjects required to be mastered by the practical architect who was ambitious to be regarded as an "all-round man."

At Truro Cathedral good progress is being made in the removal of the scaffolding round the central spire and tower; various minor improvements have been made in the interior of the cathedral; the design for the stained glass to be placed in the western windows is completed, and the system for protecting the cathedral from lightning is in hand. The terracotta panel, presented by Mr. F. Waters Bond, will shortly be in position to the cathedral, and arrangements are in progress for clearing the cathedral precinct to the north of the building.

Building Intelligence.

BIRKENHEAD.—The Nurses' Home recently built in connection with and adjoining the Birkenhead Borough Hospital will be opened by Sir Elliott Lees, Bart., M.P., on Saturday, the 26th inst. The home, which fronts Livingstone-street, consists of ground and first floors. The dining-hall and dayroom on the ground floor are convertible, if required, into one room. A feature of the overmantel in the dining-hall is a portrait of the late Mr. William Laird. The building is lighted throughout by electricity. The contract for the building has been intrusted to Mr. Peter Rothwell, of Birkenhead, the whole being carried out from the drawings prepared by and under the superintendence of Mr. Edmund Kirby, F.R.I.B.A., of Liverpool.

BRIGHTON.—The memorial-stones of the Baptist church and schools, Gloucester-place, Brighton, were laid on September 16. The building is to be faced with whole-white flints, with red dressings; the seating to be in Orham wood, wax-polished. The accommodation will be for 443 adults on ground floor, 282 in galleries, total 725, or a mixed congregation of over 800 persons. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's-inn, Strand, London, W.C. The builders are Messrs. Battley, Sons, and Holness, 21, Old Kent-road, London, S.E. The present contract is for £5,381, exclusive of galleries (except choir gallery).

BROMSGROVE.—The Earl of Coventry, lord lieutenant of Worcestershire, laid on Thursday in last week the foundation-stone of the second lunatic asylum for the county, which is to be erected on the Barnsley Hall estate, near Bromsgrove. The present asylum at Powick, near Worcester, has accommodation for over 1,000 patients, and has for a considerable time past been quite full. The new estate comprises 324 acres. The plans show accommodation for 570 patients, with administrative buildings, and provide for possible extension. The contract for the building amounts to over £150,000, and the total cost is estimated at nearly £216,000.

CLIFTON, BRISTOL.—On Saturday afternoon St. Paul's Church, Clifton, was reopened at a special service, when the new reredos, chancel screen, and windows were dedicated. The reredos is 20ft. in height. The base and altar step are constructed of verte antico marble, known as the upper part is constructed of teak wood, richly carved and embellished with gold, and the centre panels are filled in with mosaic work. On both sides of the reredos are mosaic panels framed in teak and surmounted by a cornice. The centre-panel subject is "Angels adoring the risen Christ," the left-hand panel represents "The Nativity," and the right-hand panel "The Crucifixion." The eastern wall and the north and south walls of the chancel, and also the roof, have been decorated with fresco work. In the spandrels of the arches are four painted figures of angels. The architect for the alterations, under whose superintendence the work has been carried out, is Mr. H. C. M. Hirst, A.R.I.B.A., of Broad-street, Bristol. The north transept is about to be decorated to harmonise with the general scheme followed in the chancel.

FAZAKERLEY.—The Sanitary and Hospitals Committee of the Liverpool Corporation have just paid a visit of inspection to the site on which building operations have been commenced in connection with the great hospital, which is to contain 300 beds, consisting of nine ward pavilions and four isolation blocks, with entrance in Longmoor-lane, and to cost approximately £130,000. The operations are being carried out from plans by Mr. E. Sheldermine, city surveyor; the clerk of works is Mr. James. There is already on another portion of this spacious site, spreading as it does over 120 acres, a hospital wherein 150 patients can be received. This block is exclusively for smallpox.

GLASGOW.—The University Court, at a special meeting, has had under consideration the alteration of the plans for building extensions involving an expenditure, including fittings, of nearly £100,000. The plans already adopted provide for two separate buildings, one on the north and the other on the south of the main avenue, thus trenching on the recreation grounds, on which a large sum was expended by the exhibition authorities in 1901. Since the adoption of these

plans a strong opposition sprang up, and the alternative plan which the Court was called upon to consider was based on designs by Mr. Millar, architect of the exhibition, providing for all the departments in one new building north of the avenue. The Court, after full consideration, decided that there were not sufficient reasons for stopping the present operations.

GOVAN, GLASGOW.—The Elder Free Library, which has been gifted to the burgh of Govan by Mrs. John Elder, who has, in addition, endowed the building, was opened on Saturday afternoon by Dr. Andrew Carnegie. The library, which is classic in character, occupies a site at the south-east corner of Elder Park. An entrance portico forms the central features of the chief front. The interior includes newsroom, reference libraries for men and women, museum, juvenile room, librarian's room, and lending library. Accommodation is provided in the last for between 30,000 and 40,000 volumes. The architect is Mr. John James Burnet, A.R.S.A., Glasgow, and the cost has been £27,000.

IPSWICH.—A new Wesleyan chapel in the Bramford-road was opened last week. It has been built from plans by Messrs. Eade and Johns, of Ipswich, and is in style Decorated Gothic. It will eventually be cruciform in plan. The front portion, the nave, which seats 400 persons, is now used as the church, while the back portion, the transepts and eventual organ recess, will be used at present as a Sunday schoolroom. A vestry is placed on each side of the chancel recess. There is an open porch approach from the front with lobby entrances, and with space reserved for stairs to a future gallery to accommodate 80 persons. When the division between the present school and chapel is taken down, the building will form one chapel capable of seating 750. Then it will be possible to erect a Sunday-school on ground on the east side, which is held in reserve. The heating of the chapel is by gas-pits. The internal roof has bold arched ribs, and is divided up into smaller ribs forming panels. Outside, the building, which is faced with red brick, is ornamented with white terracotta. The cost has been about £4,000.

NORWICH.—The new church of St. Mary Magdalene, in St. James's Parish, Pockthorpe, is nearing completion, and will be opened on November 1. A chancel and four bays and the porches have been erected as a first section. The church is in the Later Perpendicular style, and will accommodate 500 persons. The walls are of brick and blue lias stone, lime-faced externally, with local flints and Monkspark stone. The east window of the north aisle will be filled with stained-glass, the subject being "Faith, Hope, and Charity." No provision has been made for a tower, but there is a bell gable at the west-end of the church. Altogether something over £4,000 has already been spent. Mr. A. J. Lacey, of Norwich, is the architect.

OSBORNE, I.W.—Good progress is being made for the Royal Naval College on the hillside above Osborne, East Cowes. The three existing bungalows, all connected by a covered way, will accommodate 75 youths. Six more are already in hand, and the accommodation will be expanded for 300 cadets. The classrooms are arranged round the quadrangle of the old Osborne stables. The gymnasium measures 63ft. by 40ft.; the recreation-room, 102ft. by 40ft.; and the bungalows, with cadets' dormitories, bathrooms, &c., 170ft. by 26ft., with a height from floor to ceiling of 25ft. The water-tank in the tower has a capacity of 7,000 gallons, and there are good quarters for the Marines, band, and others. The new bungalows will be larger, and each will have a sitting-room attached. The foundations of the buildings are of 16in. concrete, the inclosed space being filled with gravel, while the wooden uprights are completely encased, and the walls filled with Uralite.

SHIPLEY.—The urban district council of Shipley, near Bradford, are seeking permission from the Local Government Board to borrow a sum of £24,000 for the purposes of erecting new public offices. At present the council has its offices at the Manor House in Kirkgate, an old building bearing the date of 1670. The council purchased the present site, having an area of three-quarters of an acre, some years ago, at a cost of £3,400. It is proposed to erect, in addition to offices, a fire brigade station and baths. The office block, including the caretaker's house, is expected to cost about £10,500, fire-brigade station £2,700,

swimming-baths and workshops £1,000. The main building is to have a frontage to Kirkgate, where the main entrance will be placed. On one side will be the offices of the clerk to the council, rate collector, and accountant, and on the other offices for the education committee and the medical officer. The first floor will contain the council chamber, committee-rooms, and surveyor's department. A lift will be provided, and there is to be a clocktower over the entrance.

ST. ANNE'S-ON-SEA.—A new Wesleyan church is about to be built in Church-road, St. Anne's. The trustees invited a number of well-known architects in Lancashire and Yorkshire to send in competitive designs for a new church, and from eight sets of plans received, a design sent in by Messrs. Herbert and Walter Wade, of St. Anne's and Blackpool, was selected. Messrs. Wade had sent in two dissimilar designs, and both were chosen in the last three for final selection. The one adopted is Gothic in style, and when complete the edifice will have cost about £5,500, and will seat 750 worshippers. At present it is proposed to defer the building of the transepts and gallery, so that the accommodation will be for 500. Parapets with yellow stone dressings are to be used for external walls. The interior will consist of nave, two deep transepts, chancel, and an end gallery. The pulpit will be placed at the angle of the chancel, and the choir stalls in the chancel. The minister's vestry will be adjacent to the pulpits and on the opposite side are the organ-chamber and choir-vestry. The seating, dados, and roof timbers will be in pitch-pine, and the roofing of Westmoreland green slates. Leaded lights will be inserted in the plain Gothic windows. The tower and spire will rise to a height of 120ft.

CHIPS.

Mr. G. J. Edmundson, of Ledbury, has been appointed surveyor and inspector of nuisances to the Stourport Urban District Council.

On Thursday evening in last week a public inquiry was held at the Guildhall, Lichfield, before Mr. H. P. Boulnois, inspector of the Local Government Board, in respect to the application of the city council to borrow £3,150 for the erection in Upper St. John-street of dwellings for the working classes. Mr. Emerson Brooke, the city surveyor, explained the plans which he had prepared for the corporation.

On Wednesday week the whole of the staff of Mr. H. Eeles, builder, Sevenoaks, eighty in number, who had been employed upon the model bakery, cottage, and stabling in Buckhurst-avenue, for the Sevenoaks Co-operative Society, Ltd., were entertained at supper at the Oddfellows Hall by the committee of the society. Mr. W. Lambert (president) occupied the chair, supported by Mr. E. Pawley (of the firm of Llewellyn and Pawley, architects) and Mr. H. Eeles, builder.

The urban district council of Mansfield Woodhouse have decided to apply to the Local Government Board for sanction to borrow £17,000 for sewage works and sewage-disposal.

Mr. F. J. Margereson has been appointed surveyor for the southern district under the Chesterfield Rural District Council. He at present holds a similar position under the Brampton and Walton Urban District Council.

A large clock has just been erected in the parish church tower, Cornholme, Lancashire, which shows time on one large dial, and strikes the hours. It has been made by Messrs. John Smith and Sons, Midland Clock Works, Darby, to the designs of Lord Grimthorpe. The same firm have just received an order to make a large chiming clock with four dials for the Nelson Corporation in the same neighbourhood.

A new Wesleyan chapel at Hton, near Chard, was formally opened on Friday. The erection and equipment of the building has cost £520. The architects were Messrs. Symes and Mudge, of Chard, and the contractors Messrs. Parsons and Dunster, of the same place.

Active operations are in progress in Southwark in laying down two new and comparatively short sections of electric tramway route for the London County Council. Both are double lines; one extends through St. George's-road, from opposite the Elephant and Castle Hotel, Christ Church, Westminster Bridge-road, passing by the Roman Catholic Pro-Cathedral in Lambeth-road, where a junction will be made with the existing lines from the Hop Exchange to Lambeth and Westminster bridges, Wandsworth and Battersea; the other passes through Marshalsea-road, from Southwark Bridge-road to St. George's Church, at the junction of Borough High-street and Long-lane.

Engineering Notes.

ELECTRIFICATION OF SNOWDONIA.—Operations have now been actually commenced by the North Wales Power and Traction Company, Limited, for the electrification of Snowdonia. The scene of these initial operations is Llyn Llydaw, one of the lakes on the slopes of Snowdon, where the River Glaslyn has its source. Here it is intended that the first generating station contemplated by the scheme shall be situated. Among the more important schemes under consideration are the construction of a light railway from Portmadoc, through Beddgelert to Rhyddu, to join the present narrow-gauge railway, which will then be extended from Dinas to Carnarvon, the whole line to be worked by electricity. It is also proposed to electrify the Snowdon Mountain Tramroad to the summit, and to supply electric power to the quarries in the Nantlle Vale, the Gwyrfai district, and Llanberis. All the towns of the Menai Straits, including Beaumaris, Bangor, Menai Bridge, Port Dinorwic, and Carnarvon, are embraced within the scope of the contemplated operations.

CHIPS.

The town council of Wolverhampton held a special meeting on Friday to discuss the question whether they should take over the electric tramways with the underground traction system laid down by the Lorain Steel Company, or should carry out a method of overhead traction. After several hours' discussion it was finally resolved by 23 votes to 15 against to take over the tramways from the Lorain Steel Company for the sum of £22,000, the company to supply 5,000 new boxes, which will effect a saving of £500 per year.

The statue which is being erected to the memory of Prince Christian Victor, of the King's Royal Rifles, at the foot of Thames-street Hill, Windsor, will be unveiled early in November, during the residence of the King and Queen at the Castle.

The Norwich Board of Guardians decided at their last meeting to add a nurses' home to the workhouse at an estimated outlay of £3,000.

The proposal to erect a memorial to the men of H.M.S. *Doris* who fell in the South African war is now taking definite shape. The War Office has given a pom-pom which was captured by the Naval Brigade before Ladysmith as part of the memorial, and it is proposed to erect it in Devonport Park. It is proposed to place the pom-pom on a huge pedestal of granite, in which will be inserted marble slabs recording the object of the memorial and the circumstances under which the pom-pom was taken from the Boers. The work is to be executed by Messrs. Harry Hems and Sons, of Exeter.

Mr. A. E. Sanford Fawcett held a Local Government Board inquiry at the town-hall, Brierley Hill, on Friday, into the application of the urban district council for sanction to borrow £25,850 for a system of deep drainage within the district. Mr. J. H. Wilcox, consulting engineer, explained the proposals.

At a representative meeting held in the Free Library Buildings, Dundalk, it was resolved to establish a County Louth Archaeological Antiquarian Society. Mr. Joseph Dolan, M.C.C., presided. It was decided to defer the election of officers of committee until January, and in the mean time a provisional committee to organise the society was formed, with Mr. O. J. Kelly, J.P., as treasurer, and Henry Morris as honorary secretary.

An inquiry has been held on behalf of the Local Government Board at Horwich, Lancs, into an application for sanction to borrow £12,000 for sewage works designed by Messrs. Hinnell and Murphy, M.N.I.C.E., of Manchester and Bolton. The sewage to be treated is 500,000 gallons dry-weather flow, and the scheme provides for a population of 20,000.

The Columbian Fireproofing Co., Ltd., 37, King William-street, E.C., have obtained the contracts for fireproof floors, and have commenced the work, at the Hospital for Consumption, Liverpool, for which the architects are Messrs. Grayson and Ould, F.F.R.I.B.A., of Liverpool, and the new Mission Hall, Bethnal Green, for which the architect is Mr. S. Clifford Tee, F.S.I., 50, Moorgate-street, E.C.

Mr. E. A. S. Fawcett, an inspector of the Local Government Board, held an inquiry on Friday at Stourbridge into an application by the urban district council for power to borrow £1,000 for the purchase of land and for the provision of a refuse destructor.

At Stratford-on-Avon, on Tuesday, the new women's workhouse infirmary, erected and furnished at a cost of about £1,000, to accommodate thirty-three patients, was opened.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LIII., LXXI., LXXIV., LXXV., LXXVI., LXXVII., LXXVIII., LXXIX., LXXXI., LXXXII., LXXXIII., LXXXIV., LXXXV., LXXXVI., LXXXVII., LXXXVIII., LXXXIX., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

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The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

*. Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—H. W.—R. G.—D. N. and Co.—R. E. C.—W. C. L.—F. T. S.—E. G.—K. C.—P. L.

Correspondence.

SUGGESTIONS FOR FIRE PREVENTION.

To the Editor of the BUILDING NEWS.

SIR,—The paper by Mr. B. Dicksee embodies many of the ideas of previous writers, and would be greatly in advance of the present Building Act regulations. The whole matter will shortly be considered by all the bodies interested in the matter, and while each committee will endeavour to make the best and most practical suggestions to the London County Council, it must always be remembered that great increase in the cost of buildings must be avoided, or there will be a still further exodus of factories, &c., from London to the outside districts where the regulations are not so strict. Many factories have been removed, and each one causes loss and injury to many persons.

It has been found that much injury has been done to tradesmen and others by the removal of dwelling-houses and of factories, and should a severe law cause the closing of the

present factories the condition of central London will be sad indeed, as rates are rapidly going up through the extravagance of local bodies in erecting baths and other buildings which are not really required.—I am, &c., SURVEYOR.

PROPOSED ALTERATIONS AT HARROGATE.

SIR,—On page 309 last week you call attention to a proposal to further disfigure the most frequented part of this flourishing watering-place.

The old Pump-house has some merit, and represents architectural art at the time of its erection. A few years since a very ordinary shed of iron and wood was erected adjoining the old building, and I found surveyors taking levels for the proposed new building.

I suggest, after considering the matter on the spot, that a properly designed stone building be erected on the site of Rose Villa and the end of the Valley Gardens, to form an appropriate entrance to the Valley Gardens, and give a spacious hall for the distribution of the nauseous water. Directly the work is completed, remove the ugly structure above referred to, and restore that side of the road to its former condition.

It is absurd at the present day to suppose that a good stone building could not be erected without interfering with the sulphur spring, when buildings in all directions have been erected.—I am, &c., HENRY LOVEGROVE.

SOME NEW BRIDGES.

SIR,—If one of the artistic members of your staff should take a stroll in the locality of the Hoxton portion of the Regent's Canal he will receive a severe shock, and wonder whether he is indeed in the third year of the 20th century. Two new bridges are being erected—one called the Rosemary Branch, giving largely-increased access between the Southgate-road and Bridport-place; the other, called Cat and Mutton, connects the end of Goldsmiths'-row with the London Fields. Nothing more hideous can be imagined surely for so narrow a span. Some graceful form could have been adopted, and a balustrade in place of the very plain built-up girders, with massive plain piers, which disfigure the view from both the canal and the road. I have no idea who is responsible for the design (or absence of it), but know that pounds are wasted in other structures in meaningless ornament, while here no attempt has been made to design graceful construction or to ornament construction.

How different are things on the other side of the Channel?—I am, &c., BALBUS.

The death occurred on the 8th inst. from pneumonia in his sixty-third year of Mr. Joseph A. Pippet, of Solihull, Warwickshire. As an artist his work was chiefly in connection with ecclesiastical decoration. Some of his paintings and window designs are to be found in St. Charles' Roman Catholic Church, Aigburth; St. Alexander's, Bootle; St. Marie's, Southport; and St. Mary's, Highfield-street, Liverpool.

At Jesmond Parish Church, Newcastle, on Sunday, four new stained-glass windows, which have been placed in the baptistry at the west end of the church, were unveiled and dedicated. The task of providing the windows was intrusted to Messrs. Wailes and Strang, of Newcastle. The four lights are in pairs, side by side, and each contains an allegorical figure, the four figures representing Love, Peace, Faith, and Hope.

The Infectious Diseases Hospital, Scarborough, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke flues, patent Manchester grates, exhaust roof ventilators, outlet panels, and special inlet ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. John Bellerby, J.P., D.L., of Burnholms, Heworth, York, died on Monday, aged 70 years. He was a native of the city and the only son of Mr. John Bellerby, proprietor of St. George's sawmills, and a timber merchant, with whom he was for many years in partnership. On his father's death he became sole proprietor, and carried on the undertaking with such success as to be able to withdraw from business life some 25 years ago. He subsequently devoted himself assiduously to public work in the city of York.

The date of the visit of Princess Louise (Duchess of Argyll) to Liverpool to lay the foundation-stone of dwellings for workpeople in a cleared area in Hornby-street is fixed for Wednesday, November 4. The dwellings will cost about £250,000, and a recreation-ground will be provided.

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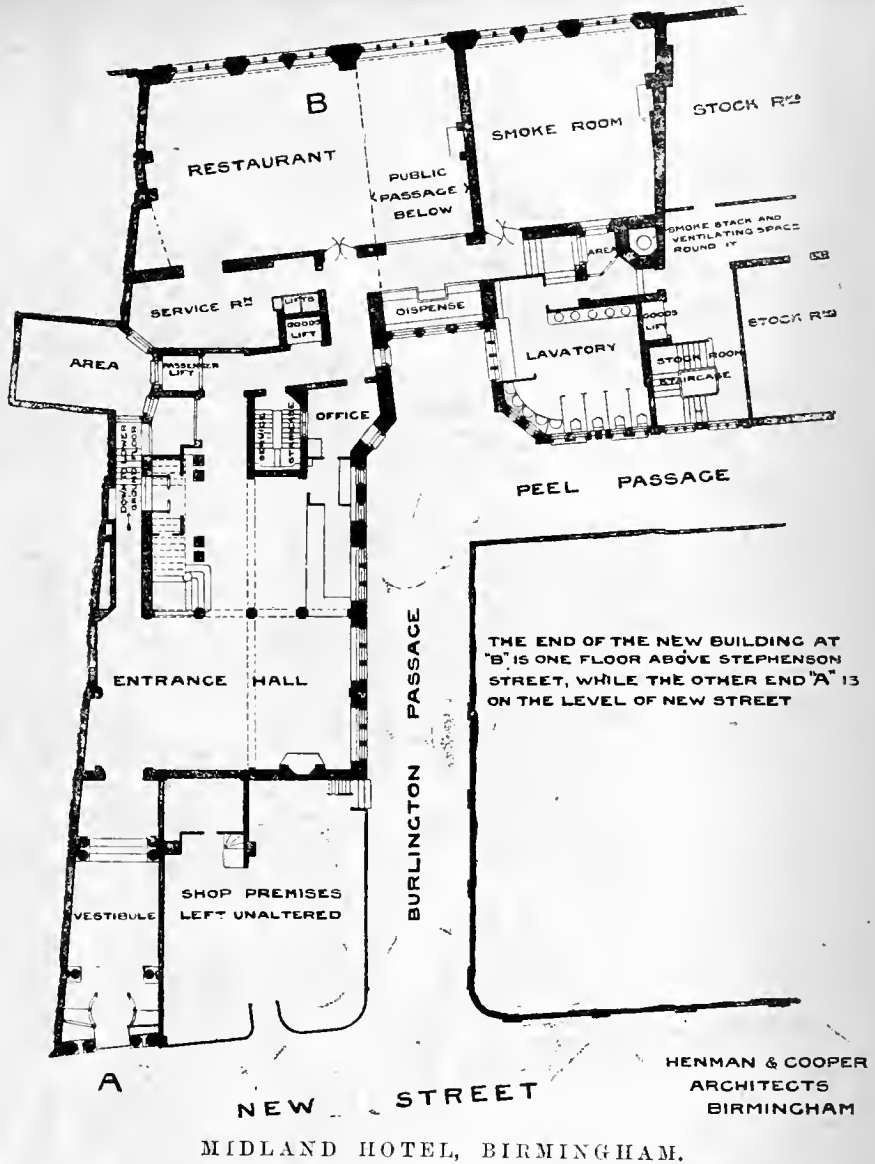
ILLUSTRATIONS.

MIDLAND HOTEL, BIRMINGHAM.—ST. MARGARET'S CHURCH, LEEDS.—BEDFORD COUNTY HOSPITAL.—VILLAS AT PRENTON, CHESHIRE.—ALPHA LODGE, PARKGATE, CHESHIRE.—SMALL HOUSE AND GARDEN AT WINDERMERE.—SHREWSBURY SKETCHES.

Our Illustrations.

RECONSTRUCTION OF THE MIDLAND HOTEL, BIRMINGHAM.

Of the rebuilt portion of this hotel, we publish to-day the ground-floor plan and a view of the Stephenson-street front which faces the London and North-Western Railway Station. The ground floor is at the level of New-street, and a sharp drop in the ground causes it to appear as the first floor in Stephenson-street. Both these streets have public entrances, their halls, the connecting stair between the two levels, the ground-floor corridors, and principal staircase being lined with Skyros marble. The Stephenson-street level or lower ground floor includes a buffet lined with red Devonshire marble and alabaster, and a large billiard and smoking room, with the necessary adjuncts. The New-street level (ground floor) has a restaurant, with smoke-room adjoining—both oak-panelled—with retiring rooms in white marble up to the ceiling. On the first floor the commercial room is above the restaurant, and the commercial writing-room above the smoke-room, a similar block of retiring rooms to the one below being arranged close by, past which on both floors a passage leads to a very extensive range of stock-rooms. The coffee-room, with sundry private sitting-rooms, is also on the first floor, the former being in an old part of the building facing New-street but little affected by the alterations. As regards the bedrooms, about 130 out of 160 or more are in the old portions of the building, which extends for three floors in depth over the whole area of two large adjacent blocks, occupied in the lower stories as shops and offices. The water-supply is from an artesian well, sunk below the building, and is pumped up to a 10,000-gallon tank in the central gable of Stephenson-street. Steam for cooking, heating, &c., is generated in two large boilers. Electric lighting obtains all over the building, gas being used for cooking only. The kitchens are on the top floor, with four large lifts down to the public rooms below. Telephonic communication is provided for every bedroom. Below ground is extensive cellarage in a basement and sub-basement. The servants' and goods entrance is quite removed from public view, the servants being able to enter the building and reach the topmost floor unseen by the guests. The whole of the new part of the building is fire-resisting, having steel joists and coke-breeze concrete for flooring, with finished surfaces of cement in bedrooms, &c., and marble in corridors. The principal staircase is likewise of steel and concrete, with casing of white Sicilian marble. The lower mansard slopes of the roofing, with the ceilings of the top floor, are fire-resisting also. Ventilation of the large rooms is assisted by an upcast flue around a cast-iron smoke-stack from the



boilers, and by a propelling fan for the billiard and smoking room. Messrs. W. Henman and T. Cooper are the architects.

ST. MARGARET'S CHURCH, LEEDS.

Mr. TEMPLE MOORE is the architect of this church, but no further particulars have reached us.

BEDFORD COUNTY HOSPITAL: DETAIL OF ENTRANCE FRONT.

This working drawing by the architect, Mr. H. Percy Adams, shows the principal entrance to the administrative buildings of Bedford County Hospital. A description of the institution was given in our pages for Feb. 9, 1900, when some photographs appeared among the plates. Prior to that some other illustrations were printed in the BUILDING NEWS for Dec. 30, 1898, and Feb. 31, 1899. On April 23, 1897, a full account of the work was given in our journal.

VILLAS, PRENTON, CHESHIRE.

THESE villas have been erected for Mr. A. E. Williams, and are carried out in red brick, cement roughcast, and tiled roof. The contractor was Mr. Richard Allen, Birkenhead, and the architect Mr. T. Taliesin Rees, F.R.I.B.A., Liverpool and Birkenhead.

ALPHA LODGE, PARKGATE, CHESHIRE.

This residence has been erected at Parkgate, Cheshire, for Mr. A. G. Grenfell. The half-timbering is English oak, and the roof red tiles. The contractor is Mr. R. T. Amery, and the architect Mr. T. Taliesin Rees, F.R.I.B.A., Liverpool and Birkenhead.

A SMALL HOUSE AND GARDEN AT WINDERMERE.

This house is being erected at Windermere for Mr. R. R. Mawson, and has been designed, as far as possible, in character with the old surrounding Westmoreland buildings. Local material has

been used throughout. The walls of stone are roughcast and limewhited, the roof covered with green Westmoreland slates. Special attention has been given in designing the gardens, as indicated on sketch plan. The plan shows private offices, the house being in proximity to the owner's large Windermere nurseries. The drawing, which was in this year's R.A. Exhibition, is by Mr. A. N. W. Hodgson. The architect is Mr. Thomas H. Mawson, of Conduit-street, W., and Windermere.

SHREWSBURY SKETCHES.

(For description and further sketches see p. 369.)

The Prix de Rome at Paris has been awarded to M. Jausse, pupil of MM. Daumet and Esquié; the next two prizes have gone to M. Wielhorski, pupil of M. Laloux, and to M. Joulie, pupil of M. Pascal, all practising in Paris.

The eleventh panel, No. 9, out of the 24 in the ambulatory of the Royal Exchange, is now filled in with Mr. A. Chevallier Tayler's picture, "The Entertainment in 1336 by the Vintners' Company to the Five Kings"—viz., Edward III. of England, David II. of Scotland, John of France, and the Kings of Denmark and Cyprus. Mr. W. Vivian is the donor, and it is expected that this spirit-fresco will be unveiled this month.

Mr. Henry Theobald, F.S.I., of 6, South-street, Finsbury-pavement, E.C., has been appointed by the libraries committee of the Metropolitan Borough of Poplar as quantity surveyor for the proposed new public library to be erected at Poplar.

The Ditchling Parish Council has recommended the Chailey Rural District Council to adopt the scheme submitted by Messrs. Beesley, Son, and Nichols, of Westminster, for the sewerage and sewage disposal of the parish, at an estimated cost of £4,020 for the engineering works, subject to certain modifications.



Nº 5





Reg M Copnall 1908

PMC '03

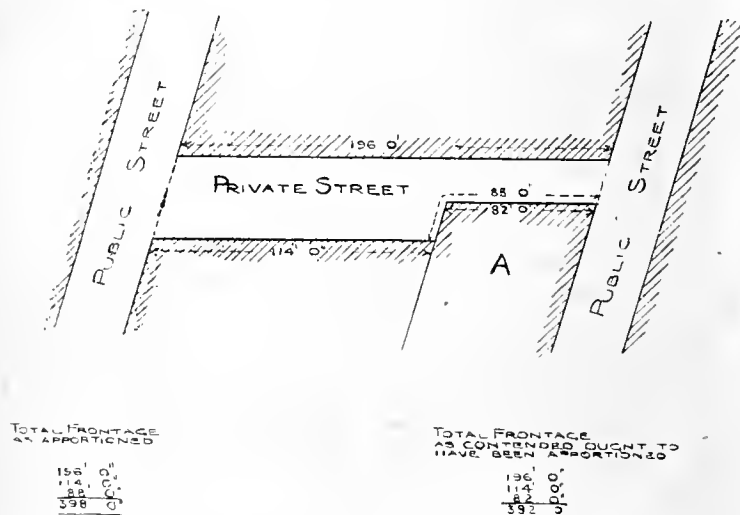


Nº 2

Intercommunication.

QUESTIONS.

[12003.]—**Private Street Works: Apportionments.**—I have just apportioned the cost for making up a street (section 130 Public Health Act, 1875—see sketch enclosed herewith, from which you will see that the whole of the lineal measurement within the confines of the street is taken as frontage adjoining and abutting the street, and the apportionment made on the respective owners according to the actual measurement of their frontage directly adjoining and abutting the work. The owner of plot A states that he should not have been charged with the return measurement, and that his



frontage is 82ft. instead of 83ft. The street has a "bottle neck" at one end, as shown, and all the works carried out are common to the whole of the owners. I shall be glad to have your correspondents' views thereon.—Son.

[12004.]—**Reservoir.**—Will some reader kindly tell me what thickness of wall is necessary for a reservoir built with hard bricks in cement, the greater part being above ground, and the depth of water in reservoir to be 8ft., inside dimensions 17ft. by 12ft.? Should such a reservoir be covered, say, with concrete?—G. W. C.

[12005.]—**Pastel.**—Will some reader kindly explain to me the difference between a crayon drawing and a pastel?—P.

[12006.]—**Distances of Adjoining Buildings.**—If my neighbour wishes to put up a building parallel with the wall and eaves of mine, does the law prescribe the distance that must be observed between his wall and mine?—R.

REPLIES.

[12002.]—**Norwich.**—"Pencil Point" is so aggressive and exigent in tone that he hardly deserves an answer. However, I have just spent a couple of days in Norwich, refreshing early memories of the old city, so I will stretch a point to reply even to a querist who declines in advance "hashed guides." The Great Eastern Railway provides convenient services of quick and punctual trains by alternative routes—*viz.* Cambridge and Ely and *viz.* Colchester and Ipswich—but there are no excursions from London, although I noted when in the city some cheap ones advertised to the Metropolis. The chief attractions of Norwich to the architectural student are the Castle, the Cathedral, St. Andrew's Hall, and the many churches; but there are some remains of the old city walls, built of flint and rubble, visible in Chapel Fields, in St. Benedict's-street, and near Whitefriars Bridge, while at least four of the shells of the old circular towers by which the wall was defended remain, although these have lost all their freestone dressings. The Castle, which dominates the city from its central mound, was for ages occupied as a prison, and having been refaced with stone half a century ago, does not at first sight promise much to the sketcher. Nearly twenty years since, however, a new gaol was built elsewhere, and the Castle was transferred by the Government to the Corporation; it has since been converted, under the direction of Messrs. Edward Boardman and Son, architects, of Norwich, into a museum; the alterations have been carried out with good taste and careful conservation of all old features; and I was delighted to see how much rich Late Norman work of the 12th century exists in the walls facing the internal court of the keep, notably in the mouldings over window and door openings in blind arcades and in the galleries with which the stout ashlar walls are honeycombed and in the crypt. The great area of the keep is covered in one span, the modern glazed roof being supported by a light stone arcade carried on plainly treated piers of Norman type; but the fittings are Tudor in treatment, and it is easy to distinguish between the original work and that made good by Messrs. Boardman. The Cathedral, like the Castle, suffered terribly during the early days of the Gothic Revival, when genuine Perpendicular turrets and windows were replaced under Anthony Salvin by pseudo-Norman work—or what passed as such sixty years ago, and the end walls of the north and south transepts were recased in new stone. The disastrous process has been continued so recently as 1875, when the west front, always the least impressive feature of the minster, was refaced; the two prominent pairs of Elizabethan cupolas which capped the lofty pinnacles on either side of the great gable and flanked the western ends of the north and south nave aisles were replaced by sham 13th-century

pinnacles, with absolutely no authority or precedent; a crop of uniform crockets sprouted along either coping of the great gable, while for the small light in roof above the stone vault over the west window was substituted a meaningless and vacant niche. Perhaps I need hardly remind "Pencil Point" that Norwich Cathedral is essentially a Norman fabric, vaulted in stone throughout, as a sequence to successive fires in the second half of the 15th century; indeed, this minster, and the abbey of Tewkesbury and Westminster, which also have apsidal terminations, are the only English churches of the first and second rank entirely vaulted in masonry; the only fragment of Early English work is in the double entrance from the choir ambulatory to the destroyed Lady-chapel, and the Decorated period is represented by inserted clerestory windows and by the greater part of the cloisters, the largest and most beautiful in

England; the monuments in the building are few and of little interest of importance except that on the south side of presbytery to Bishop Goldwell, 1493, which has an effigy of the prelate in full pontificals. The modern works include a seated statue of Bishop Bathurst, 1837, by Chantrey, in south transept, and a recumbent figure of Bishop Pelham, 1893, by James Forsyth, somewhat stiff in pose, but an excellent likeness of the late prelate; it occupies the centre of north transept, on an obtrusively polished altar tomb of veined alabaster. There are four sixteenth-century altar tombs between the nave and its aisles, which have been several times shifted, and would be of more interest to the public if the Dean and Chapter provided cards giving in bold lettering the names and dates of death of those commemorated. During my former visits the interior of the cathedral has always seemed to me deplorably dusty, dingy, and unkempt, the wall surfaces were disfigured with ancient whitewash, and the transepts choked up by modern screens and pews. Under the *regimes* of Dean Lefroy these eyesores are things of the past, and cleanliness and order reign where dirt and neglect were too apparent. The whole of the walls, columns, arches, and vaults have been unlinked of their coats of ochre and whitewash, cement fillings in have been made good in sound masonry, decayed timbers restored, the floors of nave and transepts lowered and levelled, the foundations protected by an external course of concrete, and the doors of the triforium have also been laid with concrete, at a total cost of some £20,000. The only works in progress this week seem to be on the west walk of the cloister; but external repairs appear urgent, especially the unfortunate west facade. The "unliking" of the internal masonry, which was executed, not with the usual steel comb, but by smartly tapping the surface with a chisel, has not only revealed many traces of Medieval frescos and stencil colouring, but has made clear some constructional parts which have previously been difficult to understand. Even so independent an observer as Mr. Francis Bond speaks with awestruck admiration of the engineering feat performed by Bishop Goldwell when he replaced the Norman pillars and arches in the presbytery by new piers and four-centred arches in the fashionable style of his own day, leaving the original 12th-century masonry of the triforium unaltered. But an inspection this week of the actual work as cleansed shows that Goldwell only cut away the face of the masonry and applied a veneer at the thickest 2½ in. to 3 in. through of new stone, so that he had no need for anxiety as to the safety of the superstructure; indeed, on the ambulatory sides he left the Norman work alone where it did not show. I must utter a passing protest against the glaring polychromatic treatment of the apsidal Jesus Chapel, in which a plain, unaccompanied daily service is held. St. Andrew's Hall is the vast nave of a mid-14th-century Dominican church, bought of Henry VIII. for £50 by the corporation, who utilise it for concerts and public meetings, and have hung it with an interesting collection of portraits in oil of local worthies, by Gainsborough, Beechey, Herkomer, Frank Holl, Sandys, and J. P. Knight. Admission free, but a sixpenny tip to the hall-keeper will procure admission to the crypt below, to the chancel (now known as Blackfriars Hall), and to remains of cloisters on north side. I should have said that admission to the Castle is free from 10 to 4, excepting on two days a week, when a charge of 3d. is made, and that the Cathedral nave is open all day, the nimble sixpence opening the doors to transepts and presbytery; the vergers, wearing naval medals of the Egyptian campaign, is unusually well informed. "Pencil Point" should seek permission to walk round the wide triforia, but not forget the unprotected outlook into nave and presbytery, and the presence at irregular intervals and varying levels from ankle to knee of water and gas-mains and heating pipes. Besides these buildings there is the rather diminutive

but interesting Gaildhall, a flint-faced edifice in the Market Place dating from 1407, containing some excellent Tudor wood fittings in the council chamber, and over thirty Medieval churches, of which the chief is St. Peter Mancroft, a vast transepted 15th-century edifice, in the Market Place, with great western tower completed by G. E. Street nearly twenty years ago; St. Giles, a large Late 14th-century building, with tower 126ft., standing on a commanding hill site; St. John de Sepulchre in Ber-street, and the well-placed church, which has recently given rise to some controversy as to the restoration of the pinnacles to the tower just carried out by Messrs. Brewill and Bailey, of Nottingham. The old churches of Norwich are closely sprinkled along the lines of thoroughfare in the more ancient parts of the city, and in many cases seem sadly in need of reparation—the tide of well-to-do population has probably receded from them to the suburbs; but for this very reason "Pencil Point" will have much to study and sketch in almost every one, and every period from the 10th to the 19th century is represented. In modern church work I can only refer in passing to the vigorous treatment of a 13th-century motif in the Roman Catholic Cathedral at the top of St. Giles's-street. This has long been in hand, the long stone-vaulted nave now in use having been designed by the late Sir Gilbert Scott; the south transept has been added, from drawings by his son, Mr. Oldrid Scott, under whom workmen are now adding the eastern limb of the building, the cost being borne by the Duke of Norfolk.—E. W. H. P.

CHIPS.

The new car-sheds and repairing shops that have been erected for the tramways committee of the Sunderland Corporation in Hylton-road, Millfield, are now completed, and will be formally opened by the mayor on Wednesday, the 30th inst.

The works committee of Aberdeen Harbour Board has accepted the offer of Messrs. George Halliday, Ltd., to construct a new timber wharf at Pocka Pier at a cost of £12,968 6s. 7d.

The committee has now signed the contract and the work is in progress for the restoration of the ancient tower of St. Nicholas, Deptford, which dates back to the middle of the 12th century. During the past twenty years the tower has been in such a condition as to prevent the ringing of the bells (a peal of eight dated 1701), the rehanging of which at a cost of about £250 is a part of the present scheme.

Mr. James Mulcahy, an architect of some fifteen years' practice, has been appointed commissioner of buildings for the city of Boston, Mass., replacing Mr. Montague, who has been acting commissioner since the resignation of Captain Danrell. Mr. Mulcahy is still a comparatively young man, being only forty-three years old; but he has carried out a large number of important buildings in Massachusetts.

The City-square at Leeds was formally opened on Wednesday, and the statuary which adorns it was presented to the Lord Mayor for the citizens. The main gifts consist of an equestrian statue of the Black Prince, by Mr. Brock, R.A.; and statues of Dean Hook, by F. W. Pomeroy; Joseph Priestley, by Alfred Drury, A.R.A.; John Harrison, by H. C. Fehr; and James Watt, by the same sculptor. There are also two semi-nude female figures representing Morning and Evening, and executed by Mr. Brock.

The new Empire in Newgate-street, Newcastle-on-Tyne, the latest of the Moss Syndicate Palaces, was opened on Monday. The theatre is estimated to hold about 4,000 people. The architect was Mr. Frank Matcham, and the builders were Messrs. Howe and Co., of West Hartlepool.

The St. Pancras Brough Council decided, on Wednesday, after a long and animated discussion, by a considerable majority, and against the recommendation of its own electricity committee, to accept a tender for the supply of electric cables from a British firm, although it was £700 more than one received from a German firm.

The actual work of erecting the King's Sanatorium at Midhurst was commenced on Tuesday, a large gang of men being employed on the foundations of the building. The various portions of the work have been let to different contractors. Sir John Aird is responsible for the water supply and road-making, and Messrs. Longley, of Hornsey, have secured the contract for the foundations. The contract for the superstructure has not yet been placed. The architect of the sanatorium is Mr. A. W. West, whose design, selected in competition, was illustrated by plans and details in our issue of Jan. 30 of the present year.

At Rothsay Town Council meeting on Monday a letter was received from Mr. W. J. Windsor Stuart, factor on the Bute estate, intimating that he was directed by the Marquis of Bute to offer to the town council the fields known as the Meadows, extending to 1½ acres, for a public park and pleasure ground for the inhabitants of Rothsay, at a nominal rent of 1s. per annum. The generous offer was accepted.

Broughty Ferry Town Council had a special meeting on Monday night for the purpose of appointing a gas engineer and manager in room of Mr. Forbes Waddell, whose services were recently dispensed with. Mr. Keillor, of Peterhead, who is only twenty-nine years of age, was elected.

LEGAL INTELLIGENCE.

BUILDERS VICTIMISED.—At the Mansion House Police-court on Monday, Harry Tindall, 33, clerk, of no fixed abode, was charged before the Lord Mayor with stealing a sum of £52 19s. 3d., and with obtaining a situation by means of a false character. The prisoner in June last answered an advertisement for a clerkship in the service of Messrs. T. H. Mansfield and Sons, builders and contractors, in Upper Thames-street, and gave as a reference the name of a firm of builders in Hammer-smith, in whose employment he said he had been. From the latter a laudatory character of the prisoner was received, the letter being written on a printed heading. The prisoner was taken into Messrs. Mansfield's service, and three weeks afterwards a fellow clerk who had cashed a cheque for £50 at a bank handed the prisoner the coin to count. Making some excuse to leave the office, he decamped with the whole of the money and with £2 19s. 3d. more from the petty-cash box. Nothing more was heard of him until a week ago, when he was arrested at a Rowton House, where he was lodging under a fictitious name. It had meanwhile been ascertained that the written character was false, there being no builders of the name in Hammer-smith, and the address given being that of a newspaper shop where people had letters sent to them. The prisoner pleaded "Guilty" to both charges. The Lord Mayor sentenced him to four months' hard labour for the larceny, and fined him £20 on the other charge, with the alternative of an additional term of two months' hard labour.

ARCHITECT, ADVOCATE, AND MAGISTRATE.—At Welshepool, on Tuesday, Mr. Goff, architect, Burton-on-Trent, appeared on behalf of Messrs. Salt and Co., brewers, to ask the sanction of the Bench to plans for the alteration of Mytton's Vaults in Broad-street. Mr. Goff informed the Bench that certain doors were to be altered and one closed. The plans had been before the town council, and their approval obtained. At this stage a solicitor from Newtown rose, and, addressing the Bench, said he was not often heard making objections, but he would like to say that he was not aware if the gentleman who stood before the Bench making that application held a certificate allowing him to practise as a solicitor. Solicitors had to go through long training at considerable expense, and their work should not be taken out of their hands in that way. He protested out of no disrespect for the gentleman before the Bench, but simply in the interests of the profession. The chairman said he could not see why a person interested should not be asked to explain the matter to the magistrates. He could not see that any question of professional etiquette arose. They were simply following the practice of the Court as it had been for 31 years. The application was eventually adjourned.

AN IMPORTANT PARTY-WALL CASE.—A case of importance to owners of property who intend to rebuild was decided on Tuesday last at the City of London Court. The owners of No. 30, Bouverie-street, the *News of the World* Company, rebuilt the premises in 1893, and instead of giving the usual notices under the London Building Act, 1894, and rebuilding the old party-wall which divided the property from that of Mr. Apperley (No. 29, Bouverie-street), they elected to build an entirely new wall situate wholly on their own land. When Mr. Apperley recently commenced to pull down his premises with the object of rebuilding, the Corporation of the City of London, by their surveyor, served a notice requiring the old party-wall to be pulled down on account of its dangerous condition. It was arranged between the parties that each should pay one-half of the cost of the demolition, and there was no dispute as to this point; but Mr. Apperley proposes to rebuild the party-wall on its old site, and served the usual notices under the Act, seeking to make the *News of the World* Company contribute one-half of its cost. The latter refused to contribute, as they had already rebuilt their premises in a very substantial manner on a new wall standing entirely on their own land. They stated that the proposed new party-wall will be of no use whatever to them, and that they do not intend to use it in any way, and they relied on this fact to relieve them of any liability in the matter. The matter was referred to arbitration, and the Arbitrator in his award gave it as his decision that each party should pay one-half of the cost of rebuilding the party-wall. Against this decision the *News of the World* Company appealed, and the case came on under the title of Fifoot v. Apperley, as stated above. The Judge, after hearing counsel on both sides at some length, upheld the decision of the Arbitrator, and, in giving his judgment, said that notwithstanding the fact that the *News of the World* Company did not intend at present, or (so far as they now knew) at any future time, to use the wall, nevertheless there was nothing to prevent them doing so, and he did not think it was arguable that they should have this swinging right unless they contributed to the cost of the wall. He also said that if the matter were decided otherwise, he could easily conceive the case of a similar thing being done

through sheer spite, thereby imposing a great and unnecessary burden upon the adjoining owner, although there was, of course, no suggestion of anything of the kind in this case.

WATER SUPPLY AND SANITARY MATTERS.

BURLEY.—The new works of water supply provided by the urban district council of Burley-in-Wharfedale were inaugurated on Saturday. Under the Parliamentary powers which they obtained in 1899, the urban council have added to their reservoir storage a capacity of 31,950,000 gal., a bold increase on the old storage of just under 1,200,000 gal. The new works on Burley Moor include the High and Low Lashaw reservoirs, holding respectively just over 12,000,000 gal. and 2,000,000 gal., and the Carbottom reservoir, which has a capacity of 17,210,000 gal. To supply these and the smaller reservoirs of the old system, the water rights have been secured over a gathering-ground of 300 acres, thus increasing the daily yield from 50,000 gal. to 231,650 gal., after allowing for the necessary compensation water. The works and land have cost £17,000, and a further £3,000 was expended on obtaining Parliamentary powers. Mr. Malcolm Paterson was the engineer, and Thomas Smith, of Bingley, the contractor.

DERWENT WATERWORKS UNDERTAKING.—Considerable progress is being made with the huge waterworks undertaking in the Peak of Derbyshire, in which the towns of Sheffield, Leicester, Nottingham, and Derby are chiefly interested. The complete scheme includes five reservoirs, which will impound nearly 11,000,000,000 gallons of water, gathered from a watershed which has an area of about fifty square miles, and capable of yielding an average of 50,000,000 gallons of water per day. One-third of this, however, will be restored to the river by way of compensation, leaving two-thirds available for public use. At least 2,000,000 tons of stone will be used in building the dams, which are to be of solid masonry from the foundations up, and the aggregate cost of the works, including filter-beds, aqueducts, and pipe lines, will be 47,000,000 sterling. Of this total sum the Derwent Water Board will be responsible for £5,800,000, which covers the cost of building the five reservoirs in the Derwent and Ashop Valleys, making fourteen acres of filter-beds at Bamford, carrying an aqueduct thirty miles long to Ambergate, making a small service reservoir at this point, and laying a pipe line to Sawley on the Trent. The cost will be shared by the authorities interested in the undertaking in proportion to the amount of water they take. Leicester is to have 35.72 per cent., Sheffield and Derby 25 per cent. each, and Nottingham 14.28, subject to certain claims of the counties of Derbyshire and Nottinghamshire. Sheffield will carry off its allowances by the aqueduct through the hills to the Rivelin reservoir, Leicester and Nottingham will convey their respective quota from Sawley, and Derby will help itself by a pipe line from Ambergate. The cost of the subsidiary works is roughly estimated at about £1,100,000, thus bringing the total very near to seven millions sterling.

TODMORDEN.—At Todmorden, on Friday, Mr. W. O. E. Meade-King, M.L.C.E., an inspector under the Local Government Board, held an inquiry relative to the town council's application for sanction to borrow an additional £10,543 for sewage disposal works at Sandbed, Eastwood, and £2,300 for an excess of expenditure on the Walsden sewers. The council wish to make some deviation from the scheme originally proposed and sanctioned. Under that scheme the sewage was to be treated on the "International" system by precipitation and filtration on a small portion of land; now it is proposed to adopt the bacteriological treatment of sewage without land. Including the river diversion, the sum sanctioned for the original scheme was £28,780; the council now ask for £39,323. There was no opposition.

The Wetherby Rural District Council have accepted a scheme of sewerage and sewage disposal for Bramham township, prepared by Mr. E. J. Silcock, M.I.E.E., of Leeds, and have ordered the plans to be sent to the Local Government Board, together with an application for sanction to a loan of £4,000 in order to carry out the works.

The foundation-stone of the new Children's Home for Rotherham, which is to be built on the cliffs two miles to the south of Filey, was laid on Monday by Lady William Cecil, of Hunmanby Hall.

Mr. Walter E. Bush, A.M.I.C.E., of the engineer's office, Birmingham, has been appointed borough surveyor and inspector of nuisances to the corporation of Sudbury. Mr. Bush has been assistant surveyor to the South Norwood and the Bromley (Kent) Urban District Councils, and resident engineer on the Orpington and Crofton main sewerage works. He has also acted for some years as engineer and manager for Messrs. Cooke and Co., of Westminster.

Our Office Table.

A NEW work of some account in its bearing on the amenities of Yorkshire cities and towns has, says the *Yorkshire Post*, been initiated by the president and members of the Leeds and Yorkshire Architectural Society. It is the founding of an approximation to a School of Architecture in which students may fit themselves for the responsibilities of the architectural profession and prepare for the preliminary, intermediate, and final examinations of the Royal Society of British Architects. Owing to the lack of finances the promoters are unable to proceed by the direct path that has been taken in Manchester and Liverpool, where chairs of architecture have been endowed at their respective universities. To endow a chair at the Yorkshire College for the same purpose would require a capitalised sum equal to £400 or £500 per annum. It is impossible at the present time to raise this amount of money, and under the circumstances the society will utilise evening classes at the Yorkshire College and the Leeds Institute in conjunction with classes that are to be specially organised at the Institute, and at the society's headquarters, to cover the whole course of architectural study. Until Mr. Butler Wilson took office as president of the Leeds and Yorkshire Society in 1901, there was no facility for organised study offered the student in the district. Broadly stated, engineering subjects of which the practical architect must have knowledge are to be taught at the Yorkshire College, the preliminary course of design is to be taken at the Leeds Institute under Mr. F. Musto, and the advanced course of design will be taken at the society's rooms.

The newspaper reports as to the damage occasioned at Dover by Thursday night's storm were, it is satisfactory to state, grossly exaggerated. As a matter of fact, no portion of the permanent work of the National Harbour suffered injury. Up to the present time about a mile and a half of the permanent work has been well advanced on the east and west, and about one mile remains to be completed on the south side. The sections which have made most progress are the easterly arm and the extension of the Admiralty Pier. Neither of these structures suffered in the smallest degree during the late gales, nor was injury of any sort done to the contractor's plant erected thereon. The damage was exclusively confined to the carrying away of one bay or span of an isolated stage, 50ft. long and 120ft. wide. This was temporary scaffolding, occupying part of the site of the eastern entrance to the National Harbour. Here the contractors had built a detached stage, consisting of 24 piles of Australian blue gum wood, upon which rested a superstructure of lattice girders. This temporary structure was destroyed. It was insured at Lloyd's, and instead of £70,000, as was reported in the daily Press, the damage will be about £7,000, and it is not likely to result in any prolongation of the period allowed for the execution of the whole work. The machinery on the temporary staging consisted of two cranes, used for the extension of the scaffolding, and not for setting the permanent work.

A SCHEME for dealing with ecclesiastical dilapidations will, at the instance of the Bishop of Hereford, be brought before archidiaconal conferences at Hereford and Ludlow shortly, with the idea of making the scheme a diocesan one. At the conferences it will be proposed that the incumbents' obligation should be met by an annual insurance payment, that this payment should be based on the rateable value of the property, that the parsonage house and premises and the glebe property should be dealt with and assessed separately, that present incumbents have the option of coming under this scheme when established, and that every incumbency be brought under it on the next vacancy, and that all properties be certified as in good repair when brought under the scheme. On the subject of management, it will be proposed that all insurance payments be made to the Ecclesiastical Commission, and that the rate of payment be fixed and revised from time to time by that body. The business of surveying and carrying out dilapidation repairs, it is proposed, should be conducted by diocesan committees, and each committee should appoint its own working surveyor. It is thought that the Ecclesiastical Commissioners should provide the funds necessary for dilapidations from the insurance fund or otherwise in case of need, and that they be asked to

consider the possibility of remitting the annual insurance payment in the case of all beneficiaries under £100 a year and of reducing the rate of payment for all beneficiaries between £100 and £200 a year.

CONSIDERABLE resentment has been aroused amongst manufacturers in the Potteries by a communication which has been received from the Moscow agent of Twyford's (Limited), sanitary ware makers, of Cliffe Vale, exposing a practice which is said to be doing English trade much harm. Messrs. Twyford's agent writes:—"Russian manufacturers are now 'badging' their wares with the British coat of arms, the name of the firm in English, and the word 'England.' Could not English firms send a petition to the Minister of Commerce or Finance of Russia, or to the English Consul General, to stop this nuisance, as the general public, and even plumbers, are cheated nearly every day? I think it would be worth the trouble." The matter will receive the attention of the North Staffordshire Chamber of Commerce.

A NUMBER of those interested in the question of dust prevention on the public highways attended on Monday a demonstration near Windsor, where the roads had been prepared by the sprinkling of a solution mainly of petroleum and water, the process admitting of petroleum being watered down indefinitely. A section of the road was sprinkled with the mixture by means of an ordinary watering cart. The inventor claims that a road sprinkled with a 15 per cent. solution will not require further attention for several weeks, and that the subsequent applications need only consist of solutions containing from 10 per cent. to 3 per cent. of Westrumite. The cost of the solution is £10 per ton, and a 5 per cent. solution, which is stated to be sufficient to keep an ordinary road free from dust, can be applied at a cost of half a farthing per square yard, and if that operation be repeated from five to eight times a year, the road, it is claimed, will be continually free from dust. In addition, it is pointed out that the present cost of road watering is saved. A stretch of road at Ballyshannon was sprinkled with the mixture for the Gordon-Bennett race. Although several weeks have elapsed, a telegram received from Ireland announced that the treatment of the road was still apparent, that there was a complete absence of dust, and that the continuous rains had tended to improve the sections. On Monday racing motor-cars were sent over a section of the Old Windsor-road that had been treated with a 13 per cent. solution, and there was a complete absence of dust. When once the cars passed the treated portion of the road they raised clouds of dust, which quite enveloped them. The invention is receiving a trial by the borough of Windsor. The solution cakes dust, and gives the road a smooth cement-like surface. It is not in the least slippery, and it is stated that a road so treated recovers much more quickly from the action of rain.

In connection with these experiments an official report on the oiling of roads, penned by Mr. James W. Abbott, has been issued by the United States Department of Agriculture, which possesses considerable interest. Mr. Abbott made a personal investigation of oiled roads on the Pacific Coast, and has collected valuable data concerning their history, wearing properties, cost, and methods of construction. He gives illustrations of good roads built on loose sand, and reports that there is no reason why equally good results cannot be obtained anywhere in rural districts, provided the water can be kept away from the foundations of the roads so that they will remain firm and not give way beneath the surface crust in the spring. It is important to notice, however, that reliance must be placed in an oil with an asphalt base, or one specially prepared by dissolving asphalt in crude oil. This will increase the cost of the work, but the expense is warranted by the improvement which oiling will effect in dusty highways. All petroleum will lay dust, but asphalt is required to bind the loose materials together. The report contains full directions for applying the oil, and describes the apparatus used for the purpose.

THE Stoke-on-Trent board of guardians received at their last meeting a report from a committee who had met Mr. Lynam, formerly architect and surveyor to the board, with regard to accounts received from him amounting to £1,966, and comprising in their principal items the preparation of various schemes for remodelling

the workhouse. They stated that Mr. Lynam contended that the charge of £688 for a second set of plans (a set for an amended scheme) was quite justifiable, but, as he was extremely anxious to avoid increasing the friction, he expressed his willingness to settle the account for £1,300. This offer the committee recommended the board to accept. The report was adopted, the chairman, Mr. Wilkinson, remarking that Mr. Lynam had met the board like a gentleman.

SOMEWHAT better results are reported by the Associated Portland Cement Manufacturers, the profits for the year ended June 30 last being some £33,000 larger than those of the preceding twelve months. The company is again able to pay its preference dividend in full, but nothing is distributed on the £1,925,000 of ordinary share capital, which has been dividendless ever since the inception of the combine in 1900. This year, however, £25,000 is placed to general reserve fund, and the carry forward increased from £1,500 to £6,900. The directors continue to lay all the blame on "importations of cheap foreign cement." These importations are certainly unfortunate for the combine, but the builder has benefited, and there are those who declare that if the company would abandon costly and antiquated methods of production and adopt those employed by foreign producers, whose chief crime is cheapness, both the shareholders and the public would be gainers.

MR. W. J. NICHOLS, of Chislehurst, has conducted a party of antiquaries over the curious caves and passages there concerning which he recently read a paper before the British Archaeological Association. Starting from the only entrance in the face of the cliff, close to the railway station, the visitors walked through about four miles of passages formed with considerable regularity, measuring about six to ten feet in height, with occasional dips of less height, and a breadth of three to twelve feet. The walls in the solid chalk show numerous marks of the pick, and curve in slightly at the top, with a flat roof formed by the under surface of a stratum of chalk. There are alcoves or side-chambers with beehive-shaped domes, daises or altars, side passages ending in *cul-de-sacs*, and in one of these labyrinthine walks is a well of very fine and true work and reaching to about 300ft. in depth. Conjectures have been widely hazarded as to the object of these workings, but nothing at present is definite beyond the facts that Roman pottery and worked flints have been found.

A RECENTLY-ISSUED report of the United States Census Office gives some results of the working of the tramways in the Republic during the year ended June 30, 1902. In the twelve months previous to that date the length of line has increased by 188 per cent., and the number of passengers carried by 138 per cent. The most significant and suggestive feature of the return is that the miles of line worked by animal power have decreased 95, by cable 51, by steam 76 per cent.; while those worked by electricity have increased by 1,637 per cent. There are 997 companies (no tramways being worked by municipalities) with 16,648 miles of track or route, and 22,589 miles of single line; 352,947 and 260,121 passengers are carried yearly per mile of route and of single line respectively, and the car mileage was 65,942 and 48,599 per mile of route and of single line respectively. The nett profit is, however, equal to only 1.44 per cent. on the capital, and the cost of construction is placed at £25,096 per route mile, and £18,495 per single mile.

EXTENSIVE works of street improvement are being carried out by the borough council of Stepney. In the Mile End district Globe-road has been widened from 20ft. to 40ft. at its southern half; Hatford-street and Ely-terrace have also been widened; Brantridge-street has been opened up with the Mile End-road at a cost of £1,522; and Stayners-road widened and diverted. In Limehouse a project is on foot for widening the Commercial-road near the Britannia Bridge; the improvement of Narrow-street is in progress. Wapping Wall is also being widened at a cost of £2,127, while property has been acquired at a heavy cost for widening Three Colt-street. In addition the London County Council is widening Mansell-street to a width of 50ft. to accommodate the Tower Bridge traffic.

ON Saturday evening, Messrs. William Cowlin and Son, contractors, of Bristol, entertained their office staff and managers to dinner at the Wine-street Restaurant, to celebrate the approaching

marriage of Mr. Charles Cowlin. The chair was taken by Mr. Frank Cowlin, the head of the firm. After the loyal toasts, Mr. William Kidwell proposed the health of Mr. Charles Cowlin. Mr. W. H. Collett, the head of the office, then presented to Mr. Cowlin, on behalf of the employees, a silver salver and an illuminated address containing the congratulations of the employees. Mr. Charles Cowlin returned thanks. The toast of the visitors was responded to by Mr. Frank Wills, Mr. Arthur Scull, and Mr. E. Turner. To the chairman, Mr. W. Kidwell presented an illuminated address on behalf of the employees. Mr. Frank Cowlin, in returning thanks, alluded to the great development of the firm in the last ten years, mentioning that now they gave employment to about 1,000 men. A musical programme was carried out, and the evening was brought to a close by the singing of "Auld Lang Syne."

THE city council of Puebla has presented to the well-known English architect, Mr. C. J. S. Hall, a resident of that city, a gold medal in a handsome case, as a recompense for his services as designer of its new municipal palace. The medal bears on one side the coat-of-arms given to the city by Carlos V. of Spain, and on the other appears, beautifully engraved, this inscription: "El Ayuntamiento de la Ciudad de Puebla, al Arquitecto Charles J. S. Hall, Premio por su Proyecto del Palacio Municipal." It will be remembered that the Royal Institute of British Architects of London elected Mr. Hall unanimously as a Fellow of that body in recognition of the architectural merit of the above building, which has also been praised by such artists as Mr. Sylvester Baxter, Antonio Rivas Mercado, Adamo Boari, the Baroness von Heyking, Professor Rowe (of the University of Pennsylvania), Mrs. Alec Tweedie, and many other Mexicans and foreigners of distinction.

ONE of the notable exhibits in the United States Building at the Louisiana Purchase Exposition will be furnished by the geological survey. Professor A. H. Thompson is now in the valley of the Salt River, gathering data which will be used in the construction of three models that are to demonstrate the Government's irrigation plans to the uninformed public of the Eastern States. One model will be of the 250ft. Tonto storage dam; the second will include a section of the box canyon below the dam, and the third, showing a typical irrigated area, will be a close reproduction of Mesa City, on a scale of 2in. to the mile. The last model will show every house, farm, and orchard, as well as all the ditches, with their headgates and power-works. Mesa City is a model irrigated community. Originally settled by the thrifty Mormons, the holdings are small and the utmost use is made of every acre. It is situated on a fertile tableland about eighteen miles east of this city.

THE ARCHITECTURAL ASSOCIATION.

COURSES OF INSTRUCTION IN ARCHITECTURE.
The Day School will open on MONDAY, September 28th, at 9.45 a.m. Intending pupils are requested to forward their names to the Secretary as soon as possible.
The Evening School also opens on the same date at 6.30 p.m.
A pamphlet containing full information as to the Classes and advantages of membership may be obtained upon application to the Secretary, at 36, Great Marlborough-street, London, W.
H. P. G. MAULE, } Hon. Secs.
H. TANNEA, Jun., }

The seating accommodation of St. James's Church, Woodside, Horsforth, Leeds, has for some time past been found too small, and a new aisle has now been completed which has an additional seating capacity for 130 persons. Other alterations have been made, including a new oak pulpit, elaborately carved. The total cost has been £2,000. The dedication service was held on Tuesday evening, the preacher being the Bishop of Ripon.

The City Temple, internally redecorated at a cost of £7,000, with an additional stained-glass window—in loving memory of Dr. Joseph Parker, depicting St. Paul's farewell to the Elders at Ephesus (Acts xx.)—was reopened on Sunday. A conspicuous alteration is the removal of the platform that formerly fronted and partly hid the varied coloured marble pulpit, the gift of the City Corporation, which is now fully visible.

A stained-glass window has been placed in the Grange Congregational Church, Sunderland, as a memorial to the late Mr. Thomas Steel, J.P. It has for its subject "The Ascension of Christ."

The Coventry Corporation adopted, on Tuesday, the design of Messrs. Wailes and Strang, of Newcastle-on-Tyne, for the memorial tablet to Volunteers and others from the city who served in the war in South Africa. The tablet is to be fixed in the lobby of St. Mary's Hall.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN AUGUST.—The monthly memorandum prepared by the Labour Department is based on 3,442 returns—viz., 2,130 from employers or their associations, 1,248 from trade unions, and 64 from other sources. It reports that the general state of employment in August continued to show some falling off as compared with the preceding month, and was worse than a year ago. In the 226 trade unions, with an aggregate membership of 561,946 making returns, 30,751 (or 5.5 per cent.) were reported as unemployed at the end of August, as compared with 4.9 per cent in July, and 4.5 per cent. in the 222 trade unions, with a membership of 551,565 from which returns were received for August, 1902. The mean percentage of unemployed returned at the end of August during the past decade was 4.3. In the building trades employment continues moderate, with little change as compared with a month ago and a year ago. The percentage of unemployed trade-union members among carpenters and joiners was 2.9 at the end of August, compared with 3.3 at the end of July and 2.8 a year ago. The percentage for plumbers was 7.1 at the end of August, compared with 6.7 at the end of July and 6.1 a year ago. Employment in the furnishing and wood-working trades shows some little change compared with a month ago and a year ago. The percentage of unemployed trade-union members at the end of August was 4.0, as against 3.9 in July and 3.6 in August, 1902.

BRADFORD MASONS' DISPUTE.—Sir William Markby, the arbitrator appointed by the Board of Trade at the request of the Mayor of Bradford in reference to the dispute which occurred in the early part of the year between the operative masons and the employers, has now given his award. The men were desirous of abolishing a clause in the agreement of January last year to the effect that no strike or lock-out shall be permitted where the dispute rests solely on the question of the employment on the same job of society and non-society men. The arbitrator quotes the agreement arrived at in January, 1902, pointing out that for some reason the part of this agreement relating to the employment of society and non-society men was not embodied in the rules; but it has been assumed by both parties that this part of the agreement is subject to alteration under Rule 9, which provides for alteration in the rules on due notice being given, and notice was given accordingly by the masons in January, 1903. The parties could not agree, and the matter went before the Board of Conciliation, but no decision was come to, and it was then determined to refer the matter to arbitration. His award is that the words, "And, as to the employment on the same job of society and non-society men, it is understood that no strike or lock-out will be permitted where the dispute rests solely on this question" be struck out from the agreement of January 14, 1902; but that in other respects that agreement shall stand.

GLASGOW.—The dispute in the sett-making trade in the Glasgow district has been settled as the result of a compromise. Five months ago the employers proposed a reduction of wages to the extent of about 30 per cent. The men, refusing to accept this, came out on strike in April. A short time ago the Aberdeen Quarrymasters' Association intimated that unless the dispute was settled within a fortnight from the date of that notice a general stoppage of work would take place. The subsequent negotiations have resulted in the acceptance by the men in the Glasgow district—which embraces Airdrie, Kilsyth, Condorath, &c.—of a reduction equal to about 15 per cent. They returned to work on Monday.

NEWCASTLE-ON-TYNE.—The Town Improvement Committee of the Newcastle Corporation have received a deputation representing the Labourers' Union with reference to the wages allowed to their members for demolishing houses on the Quayside for the purpose of widening that part of the city. At present the corporation were paying 5½d. per hour, whilst for similar work, it was declared, the Master Builders' Association of the city were paying 6½d. per hour. On the other hand, the city engineer intimated that he was informed 5½d. per hour was the standard wages. The committee are making inquiries of the Builders' Association, to ascertain definitely what really is the amount paid by the members for the work.

The new naval barracks now in course of erection at Portsmouth are the largest quarters on shore in the world, and cover an area of 62½ acres. They will provide accommodation for 6,200 men, and have cost half a million sterling.

The Battersea Borough Council have decided to provide a hall and committee-rooms for public meetings at an approximate cost of £2,640.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English.....	6 10 0 "	6 12 6
Wrought-Iron Girder Plates.....	7 0 0 "	7 5 0
Bar Iron, good Staffs.....	8 5 0 "	8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0 "	20 0 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0 "	8 15 0
Best Suedsill.....	9 10 0 "	9 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.		
Builders' Hoop Iron, galvanised, £12 to £13 per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	£11 15 0	£12 0 0
gangs.....	12 5 0	12 10 0
Best ditto.....	Per ton.	Per ton.
Cast-Iron Columns.....	£8 10 0 to	£8 10 0
Cast-Iron Stanchions.....	6 10 0 "	8 10 0
Rolled-Iron Fencing Wire.....	8 0 0 "	8 5 0
Rolled-Steel Fencing Wire.....	6 5 0 "	6 10 0
Cast-Iron Sash Weights.....	7 15 0 "	8 0 0
Cast-Iron Sash Weights.....	4 12 6 "	4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0 "	9 5 0
Cut Floor Brads.....	9 0 0 "	9 0 0

Wire Nails (Points de Paris)—	Per ton.	Per ton.
6 to 7 8 9 10 11 12 13 14 15 B.W.G.		
5/- 8/- 9/- 9/8 9/9 10/8 11/3 12/- 13/- per cwt.		

Cast-Iron Socket Pipes—	Per ton.	Per ton.
4in. diameter.....	£5 15 0 to	£8 0 0
6in. to 6in.....	5 12 8 "	5 17 6
7in. to 24in. (all sizes).....	5 7 6 "	5 10 0

[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—	Per ton.	Per ton.
Cold Blast, Lilleshall.....	105s. 0d. to 112s. 6d.	
Hot Blast, ditto.....	65s. 0d. to 70s. 0d.	

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.)—

Water-Tubes	62½ "	Per ton.
Steam-Tubes	57½ "	Per ton.
Galvanised Gas-Tubes	55 "	Per ton.
Galvanised Water-Tubes	50 "	Per ton.
Galvanised Steam-Tubes	45 "	Per ton.
	10cwt. casks. 5cwt. casks.	
	Per ton.	Per ton.
Zinc, English (London mill)	£23 0 0	to £24 10 0
Do., Vieille Montagne	26 5 0 "	26 15 0
Sheet Lead, 3lb. and upwards ...	13 15 0 "	13 15 0
Lead Water Pipe (F.O.R. Lond.) ..	14 5 0 "	14 5 0
Lead Barrel Pipe	15 2 6 "	15 2 6
Lead Pipe, Tinned inside	16 2 6 "	16 2 6
Do., "		

TIMBER.

Teak, Burmah.....	per load	£10 0 0 to	£18 0 0
" Bangkok.....	"	9 15 0 "	16 0 0
Quebec Pine, yellow.....	"	3 12 6 "	6 5 0
" Oak.....	"	4 12 6 "	7 10 0
" Birch.....	"	5 0 0 "	10 0 0
" Elm.....	"	4 7 6 "	9 0 0
" Ash.....	"	4 12 6 "	8 5 0
Danish and Memel Oak.....	"	2 12 6 "	6 10 0
Fir.....	"	3 2 6 "	5 10 0
Wainscot, Riga p. log.....	"	2 7 6 "	5 5 0
Lath, Danish, p.f.....	"	4 0 0 "	6 0 0
St. Petersburg.....	"	4 0 0 "	6 0 0
Greenheart.....	"	7 15 0 "	8 0 0
Box.....	"	7 0 0 "	15 0 0
Sequoia, U.S.A.....	per cubic foot	0 3 6 "	0 3 9
Mahogany, Cuba, per super foot			
lin. thick.....		0 0 6 "	0 0 8
" Honduras.....	"	0 0 6 "	0 0 7½
" Mexican.....	"	0 0 4 "	0 0 5
" African.....	"	0 0 3½ "	0 0 5½
Cedar, Cuba.....	"	0 0 3 "	0 0 3½
" Honduras.....	"	0 0 3½ "	0 0 3½
Satinwood.....	"	0 0 10 "	0 1 9
Walnut, Italian.....	"	0 0 3 "	0 0 7½
" American (logs).....	"	0 8 1 "	0 3 1
Deals, per St. Petersburg Standard, 120—12½ft. by 1½in.			
Quebec, Pine, 1st.....	£22 0 0 to	£23 5 0	
" 2nd.....	18 5 0 "	23 10 0	
" 3rd.....	11 15 0 "	14 0 0	
Canada Spruce, 1st.....	11 10 0 "	15 0 0	
" 2nd and 3rd.....	8 10 0 "	10 0 0	
New Brunswick.....	8 0 0 "	9 10 0	
Riga.....	7 10 0 "	8 5 0	
St. Petersburg.....	8 10 0 "	16 0 0	
Swedish.....	11 10 0 "	19 0 0	
Finland.....	9 0 0 "	10 5 0	
White Sea.....	12 0 0 "	19 10 0	
Battens, all sorts.....	6 10 0 "	14 0 0	
Flooring Boards, per square of lin.—			
1st prepared.....	£0 13 0 "	£0 19 0	
2nd ditto.....	0 12 0 "	0 16 0	
Other qualities.....	0 6 6 "	0 14 0	
Staves, per standard M:—			
U.S. pipe.....	£37 10 0 "	£45 0 0	
Memel, cr. pipe.....	220 0 0 "	230 0 0	
Memel, brack.....	190 0 0 "	200 0 0	

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 3	
Red Mansfield ditto.....	"	0 2 4½	
Hard York ditto.....	"	0 2 10	
Ditto ditto 6in. sawn both sides, landings,			
random sizes.....	per foot sup.	0 2 8	
Ditto ditto 3in. slabs sawn two sides,			
random sizes.....	"	£0 1 8	
* All F.O.R. London.			
Bath Stone, delivered on rail at quarry stations	per foot cube	£0 1 0	
Delivered on road waggons, Paddington			
Depot.....	"	0 1 6½	
Ditto ditto Nine Elms Depot.....	"	0 1 8½	
Portland Stone, in random blocks of 20ft. average:—			
Brown.....	per foot cube	£0 1 5½	
White.....	"	£0 1 7½	
Delivered to railway depot at the			
quarry.....	per foot cube	£0 1 5½	
Delivered on road waggons			
at Paddington Depot.....	"	0 2 1	
Ditto Nine Elms Depot.....	"	0 2 2½	
Ditto Pimlico Wharf.....	"	0 2 2½	

FEVRE AND CO.

Blocks Palotte Banc Franc	s. d.	per c.ft. ex.
steamer London.	1 5	
Ditto ditto Banc Royal.....	1 3 do.	do. do.
Ditto Euville.....	1 9 do.	do. do.
Ditto Comblanchieu.....	3 0 do.	do. do.
Ditto Massangis (Roche).....	2 6 do.	do. do.

OILS.

Linseed.....	per tun	£19 0 0 to	£19 7 6
Rapeseed, English pale.....	"	24 0 0 "	24 10 0
Do., brown.....	"	22 10 0 "	22 15 0
Cottonseed, refined.....	"	23 5 0 "	24 5 0
Olive, Spanish.....	"	32 0 0 "	32 0 0
Seal, pale.....	"	26 0 0 "	29 0 0
Cocconut, Cochin.....	"	30 0 0 "	31 0 0
Do., Ceylon.....	"	24 10 0 "	25 0 0
Palm, Lagos.....	"	27 10 0 "	27 15 0
Oleum.....	"	17 5 0 "	19 0 0
Lubricating U.S.....	per gal.	0 7 0 "	0 8 0
Petroleum, refined.....	"	0 0 5½ "	0 0 6
Tar, Stockholm.....	per barrel	1 6 0 "	1 8 0
Do., Archangel.....	"	9 19 6 "	1 0 0
Turpentine, American.....	per tun	87 0 0 "	87 5 0

CHIPS.

The parish church of Great Chart, Kent, is in course of restoration, under the direction of Mr. Reginald Blomfield. The contractors are Messrs. Clark, of Lenham.

At a meeting of the Stratford-on-Avon Town Council, on Tuesday night, the tender of Messrs. Cox and Harris, builders, of that town, was accepted for the erection of a public library in Henley-street. This building, it will be remembered, has been a fruitful source of controversy in literary circles during the present year. Mr. Carnegie has made a payment on account of £1,000.

Mr. Alfred Gilbert, R.A., M.V.O., has removed from St. John's Wood to Bruges, where he is to open a school of art. He has taken a disused factory, which yields, besides studios, living accommodation for about 300 pupils. He proposes to do all his own work in the presence of his classes, and not only sculpture, but painting and a number of handicrafts, are to be taught under his personal supervision.

The London and North-Western Railway Co. will open, on Oct. 1, the new passenger and goods line from Leigh via Plank-lane to Wigan. This new route will not only open up a large colliery district, but will enable the Leigh people to travel to and from Blackpool in half an hour less than it now takes by the ordinary route via Tyldesley and Wigan.

The death took place at Darlington, on Sunday, at the age of 75, of Mr. T. W. Hobson, cabinet-maker, who was well known as an expert in ecclesiastical screen work.

Mr. M. K. North, M.I.C.E., held an inquiry on Friday at Harrogate relative to the application of the town council to borrow £7,000 for the provision of additional filter-beds and pumping plant in connection with the corporation waterworks at Iron-gate Bridge-road and Harlow-hill.

At Fredensborg Castle, where her Majesty Queen Alexandra is now a guest, a septic tank installation has recently been laid down by the Scandinavian Septic Tank Co., a branch company of the Septic Tank Co., Ltd., of Westminster.

On Thursday the new Wesleyan Sunday-school erected on the Birmingham-road, Stratford-on-Avon, at a cost of £2,000, was formally opened.

The inauguration of a statue of Rénan in the market-place of Tréguier, in Brittany, his birth-place, took place on Sunday. The monument, which is the work of M. Jean Boucher, depicts Rénan seated, in a pensive mood, at the age of about sixty years. Behind the statue is the figure of Minerva, holding above his head a laurel wreath.

A new organ, erected by Messrs. Hele and Co., of Plymouth, was dedicated by the Bishop of Exeter at St. George's Church, Tiverton, on Friday. The organ, which has been erected at a cost of £500, is a three-manual one, containing 30 stops. The case is of pitch-pine with oak fittings.

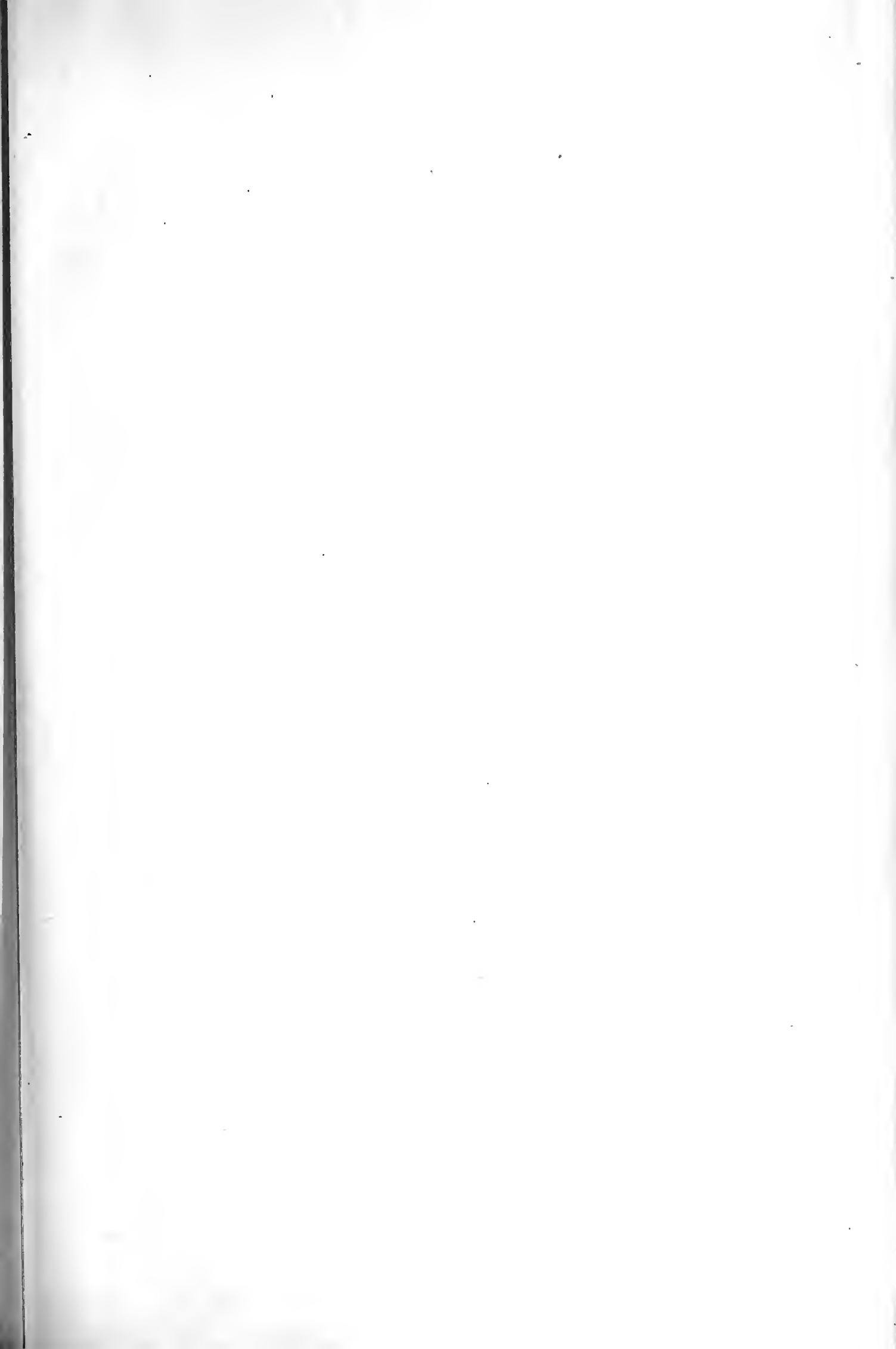
LIST OF COMPETITIONS OPEN.

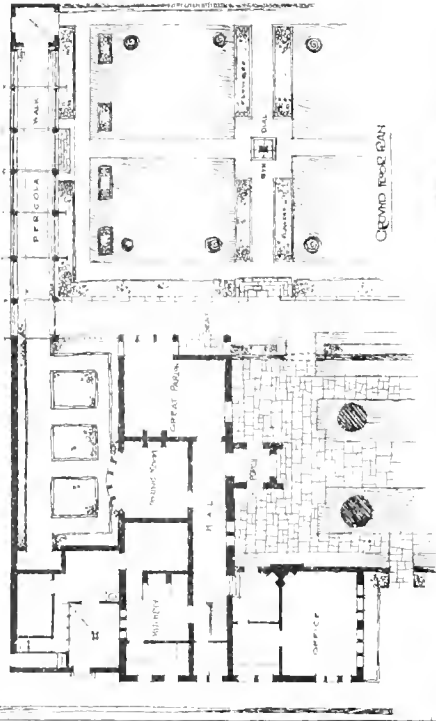
Cashe!-Dean Kinase Memorial Fountain		A. P. Spain, Hon. Secretary, Town Hall, Cashe!	Sept. 21
Ayr-Hospital		J. E. Shaw, Clerk to Lunacy Board, County Buildings, Ayr	" 22
Tamworth-Free Public Library (J. A. Cossion, Assessor)	£20, £10, £5	J. Matthews, Town Clerk, Bolebridge-street, Tamworth	" 15
Newtown-in-Makefield-War Memorial Monument £300	£10 (merged)	C. Cole, Hon. Sec., Town Hall, Earlstown, Lancs.	" 25
Leyland, Lancs.-Laying-out Land (11,902 square yards)	£15 15s.	M. H. Wilkinson, Surveyor, 21, Towogate, Leyland	" 26
Brighton-Hospital for Women (Assessor)	£50, £30, £20	Leonard Holmes, Hon. Sec., 76, West-atreet, Brighton	" 29
Dublin-Workmen's Cottages		Francis B. Ormsby, Secretary, Kingsbridge Terminus, Dublin	" 30
Heywood-Library (£4,500)	£30 (merged), £20, £10	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood	Oct. 1
Bromley, E.-Public Library	£75 (merged), £25	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.	" 2
Saltwood, Elham-Sewage-Disposal Scheme	3igs.	R. Loneragan, Clerk, 11, Cheriton-place, Folkestone	" 7
Rawtenstall-Free Library and Town Hall (Assessor)	£100, £50, £30	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	" 12
Harrogate-Pump-Room and Colonnade in Valley Gardeos		F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	" 26
Sunderland-Additions to Town Hall	£100, £50, £25	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	Nov. 21
Vienna-Machinery to Lift Boats	100,000, 75,000, and 50,000 kroon	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Aylesford-Single-Span Stone Bridge over Medway (Assessor) 100gs.		The Town Clerk, Maidstone	"

LIST OF TENDERS OPEN.

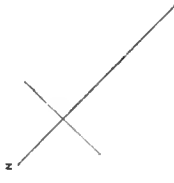
BUILDINGS.

Horton-Nine Half-Padded Rooms	London County Council	R. W. Partridge, Clerk to Asylums Committee, 6, Waterloo-pl., S.W.	Sept. 19
Drogheda-Premises, St. James's-street	Miss Lyons	F. H. Tallao, Architect, 358, Kildare-street, Dublin	" 19
Scarborough-Additions to Stables	Town Council	The Borough Engineer's Office, St. Nicholas-street, Scarborough	" 19
Newfield-Converting Two Cottages into Workmen's Club	Workmen's Club Co.	J. Foster, Secretary, Chalcies-street, Willington	" 19
Lancaster-Product Market	Properties Committee	J. C. Mount, Borough Surveyor, Town Hall, Lancaster	" 19
Withernsea-Offices	Urban District Council	G. S. Birr, C.E., Surveyor, Bank Chambers, Scale-lane, Hull	" 19
Aberaman-Rebuilding Co-operative Shops	Cwmfach Industrial Co-op. Society	T. Roderick, Architect, Aberdare	" 19
Penisa rwaen-Eighteen Houses	Committee of Visitors	Henry Thomas, Architect, 7, Castle-ditch, Carnarvon	" 21
Knowle, Fareham-Engine-House at County Asylum	Town Council	W. J. Taylor, County Surveyor, The Castle, Winchester	" 21
Motherwell-Carnegie Public Library	Property Committee	Greig, Fairbairn, and McNiven, Architects, Edinburgh	" 21
Kington-on-Thames-Alterations to Municipal Offices	John Symonds and Co., Ltd.	The Boro' Surveyor's Office, Clatterhouse, Kingstoo-on-Thames	" 21
Portsmouth-Additions to Post-Mortem Rooms	Education Committee	The Borough Engineer's Office, Town Hall, Portsmouth	" 21
Stepney, E.-Alterations to Cider Stores, Butcher-row	Urban District Council	Charles Dunch, Architect, Clement's-lane, Lombard-street, E.C.	" 21
Middlesbrough-Infants' School (500 places)		J. Bottomley, Son, and Welburn, Archts., Albert-rd., Middlesbrough	" 21
Rugby-Three Cottages		D. G. Macdonald, A.M.I.C.E., Surveyor, Rugby	" 21
Halifax-Three Houses, Hollen Edge-lane	H.M. Commissioners of Works	Fred F. Beaumont, Architect, Southgate Chambers, Halifax	" 22
Muswell Hill, N.-New Sorting Office	Corporation	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 22
Fraserburgh-Manse, King Edward-street	West U.F. Church	J. Liodsay, Clerk, City Chambers, Glasgow	" 22
Wandsworth, S.W.-Swimming-Bath, High-street	Borough Council	William S. F. Wilson, Architect, Frithdale-street, Fraserburgh	" 22
Maidsbury-Infants' School	Llandaff School Board	The Surveyor's Office, High-street, Wandsworth, S.W.	" 22
Abertridwr-Forty-three Houses	Corporation	G. E. Halliday, F.R.I.B.A., 14, High-street, Cardiff	" 22
Glasgow-Tenements	Dover Town Council	G. A. Lundie, Architect, Queen-street, Cardiff	" 22
Poulton, Dover-Laundry, &c.	Corporation	The City Engineer, 64, Cochrane-street, Glasgow	" 22
Leicester-Shelters, Lavatories, &c.	H.M. Commissioners of Works	H. E. Stilgoe, A.M.I.C.E., Boro' Eng., Biggin-street, Dover	" 22
Wigan-Enlargement of Post Office	School Board	E. G. Mawbey, M.I.C.E., Boro' Engineer, Town Hall, Leicester	" 22
Glaognickie-Infants' School	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 23
Swindon-Car Depot Buildings	Metropolitan Asylums Board	J. D. Rees, Architect, Ystalyfera, Wales	" 23
Limerick-Addition to Gate Lodge at People's Park	Victoria Building Club	Lacey and Sillar, Engineers, 78, King-street, Manchester	" 23
Dartford-Altering Southfield House	Corporation	The City Surveyor's Office, Town Hall, Limerick	" 23
Rhymney-Twenty-nine Houses, Rowles-square	City Education Committee	W. T. Hatch, A.M.I.C.E., Embaokmeat, E.C.	" 23
Manchester-Repairs to Three Cottages, Silk-street	Borough Council	W. H. Trump, Solicitor, Rhymney, Wales	" 23
Birmingham-Council School, Oldknow-road	Guardians	The City Architect, Town Hall, Manchester	" 23
Saltash-Renovating Wesleyan Sunday-Schools	Lancaster Banking Co., Ltd.	H. T. Buckland, Architect, 25A, Paradise-street, Birmingham	" 24
Woolwich-Public Baths	H.M. Commissioners of Works	J. H. Pooley, 104, Fore-street, Saltash	" 24
Kilkeeny-Rebuilding Chimney of Dispensary	St. George's-in-the-East Guardians	F. Sumner, Borough Engineer, Maxey-road, Plumstead	" 24
Sedburgh-New Premises	Erith Education Committee	Kieran Comerford, Clerk, Kilkeeny	" 24
Barry Docks-Mercantile Marine Office	Burial Board	J. Parkinson, Architect, 67, Church-street, Lancaster	" 24
Old Gravel-lane, E.-Works at Infirmary, Raine-street	E. Evans Bevan	J. Beldersons, Bridge-street, Kiog's Lynn	" 24
Abbey Wood-Elementary School (150 places)	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 25
Saltburn-Wesleyan Church and Schools	General Purposes Committee	T. Morgao, Penfryn, Ponthrydygroa, Wales	" 25
Wigan-Cemetery Extension Works	Park-place Building Club	J. R. Browne, Clerk, Raine-street, Old Gravel-lane, E.	" 25
Alowick-Converting St. James's Manse into Sunday-schools	Bedwas School Board	W. Egerton, Architect, 12, Queen's-road, Erith	" 25
Skewen-Rebuilding Cross Keys Inn	H.M. Commissioners of Works	Garside and Pennington, Architects, Pontefract	" 26
Shenfield-Two Cottages	Tynemouth Corporation	W. B. Johnson and Sons, Architects, 31, King-street, Wigan	" 26
Dublin-Pumping Station	Charles Horner	George Reavell, jun., A.R.I.B.A., Alawick	" 26
Nelson-Clock Tower on Market Hall	H.M. Commissioners of Works	J. Cook Rees, Architect, Neath	" 26
Giffach Bargued-Seventeen Houses	Borough Council	Lionel H. Marshall, Surveyor, Chippenham, Wilts	" 26
Maesycwmer-Additions to School	Deri Building Club	Spencer Harty, M.I.C.E.L., City Hall, Dublin	" 28
Fochriw-Ten Houses	Corporation	B. Ball, A.M.I.C.E., Borough Engineer, Nelson, Lancs.	" 28
Ealing Dean, W.-New Sorting Office	General Purposes Committee	Wm. Harris, Architect, Giffach, Peggan, Wales	" 28
North Shields-Shops and Offices, Saville-street	Park-place Building Club	J. H. Phillips, Architect, Clive Chambers, Windsor-place, Cardiff	" 28
Halifax-Silversmith's Works	Bedwas School Board	Wm. Walters, 5, Dynevor-street, Fochriw, Wales	" 28
Ealing, W.-Additions to Telephone Exchange	H.M. Commissioners of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 29
Seoghenydd-Baptist Chapel and School	Tynemouth Corporation	John F. Smilie, Borough Surveyor, Tynemouth	" 29
Hamstead, N.W.-Tenements, Lynington-road	Charles Horner	Walsh and Nicholas, Architects, Museum Chambers, Halifax	" 29
Pontypool-Rebuilding White Hart Hotel	H.M. Commissioners of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 29
Bootle, Lancs.-Extension of Boiler-House	Borough Council	J. Nicholas, Secretary, Station House, Seoghenydd, Wales	" 30
Deri-Thirty-five Houses	Corporation	O. E. Wiant, A.M.I.C.E., Borough Eng., Town Hall, Hamstead	" 30
Loogweh-Wesleyan Chapel and Schoolroom	Deri Building Club	Fisher and Sons, Architects, Pontypool	" 30
Bradford-Office	Corporation	B. J. Wolfenden, A.M.I.C.E., Borough Engineer, Bootle, Lancs.	" 30
Barry-Central Public Library, Holton-road	Urban District Council	James Ward, Cascade House, Deri, via Cardiff	" 30
Newtown St. Cyres-Pair of Cottages, East Woodley Farm	Quick Estate Trustees	Fred Taylor, A.R.I.B.A., Temple-street, Aylesbury	" 30
St. Mary's, Isles of Scilly-Coastguard Buildings	Admiralty	James Watson M.I.C.E., Town Hall, Bradford	Oct. 1
Ballycroy-School Enlargement	School Board	Hutchinson and Harding Payne, Architects, 11, John-street, W.C.	" 2
Pickering-Grammar School	Lady Lumley's Foundation Governors	Ellis, Son, & Bowden, F.S.I., Surveyors, Bedford Chambers, Exeter	" 2
Hoxton-square, N.-Pulling Down and Rebuilding Stores	Shoreditch Borough Council	The Supt. Civil Engineer, H.M. Dockyard, Devonport	" 2
Stratford, E.-Repairing Abbey Mills Pumping Station	London County Council	William Birrell, Architect, 200, High-street, Kirkcaldy	" 2
Naas-Sixteen Labourers' Cottages	Rural District Council	John Bilson, Architect, 23, Parliament-street, Hull	" 5
Fulham, S.W.-Two Lodges in South Park	Borough Council	J. Rush Dixon, A.M.I.C.E., Town Hall, Old-street, E.C.	" 6
Letterkenny-Floors at Lunatic Asylum	Guardians	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Watford-Additions to Wards at Workhouse	Phillips and Sons, Ltd.	D. J. Pursell, Clerk, Naas, Ireland	" 7
Clitheroe-Roman Catholic Club	W. Hancock and Co.	Francis Wood, A.M.I.C.E., Engineer, Town Hall, Fulham, S.W.	" 7
Padiham-St. Leonard's National Schools	Oscar Blackford	J. P. McGrath, Architect, Foyle-street, Londonderry	" 13
Ebbw Vale-Rebuilding Drydock Inn		C. P. Ayres, Architect, Barvale, Watford	"
Consett-Additions to House at Middles Farm		C. C. Howard Sandbach, Archt, 15, Richmond-terrace, Blackburn	"
Pontnewydd-Additions to Bridge End Inn		Thomas Bell, Architect, 14, Grimsbaw-street, Burnley	"
Chipstead, Surrey-Residence and Outbuildings		John J. Swallow, Architect, Steam Packet Chambers, Newport, Mon.	"
Brooksome-Public Library, Lake-road		R. G. Moore, 5, Rosebery-terrace, Consett	"
Truro-Alterations to Premises		N. M. Brown, A.R.I.B.A., Dock-street, Newport, Mon.	"
Shepherd's Bush, W.-Shops and Flats, Uxbridge-road		H. G. Gribble, Architect, Hill View, St. John's, near Woking	"
Leeda-Additions to House and Stables		Samuel J. Newman, F.R.I.B.A., Branksome, Parkstone	"
Clacton-on-Sea-Residence		Silvanus Treval, F.R.I.B.A., Truro	"
Harrogate-Farmhouse at Paonal Ash		Pulgrave and Co., Architects, 28, Victoria-street, Westminster	"
Evenwood-House		Mossley and Co., Estate Agents, 6, Wormwald-row, Leeds	"
Blackburn-Cottage Homes for Disabled Soldiers		George Gardiner, Architect, 11, Marjoe-parade, Clacton-on-Sea	"
Punflett-Twenty Workmen's Cottages		Bolshaw and Stevens, Architects, 1, Princes-street, Harrogate	"
Clacton-on-Sea-Detached Residence		Pegg and Farrow, Architects, 7, Market-place, Barnard Castle	"
Utley-Stable, &c.		McCall and Robinson, Architects, 7, Tacketts-street, Blackburn	"
Skircoat, Halifax-Two Villas		V. Millett, 72, Bishopgate-street, Within, E.C.	"
Pwll-Mission Church		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	"
		Moore and Crabtree, Architects, York Chambers, Keighley	"
		Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	"
		C. A. Jones, Cilymaenllwyd, Llanelli	"

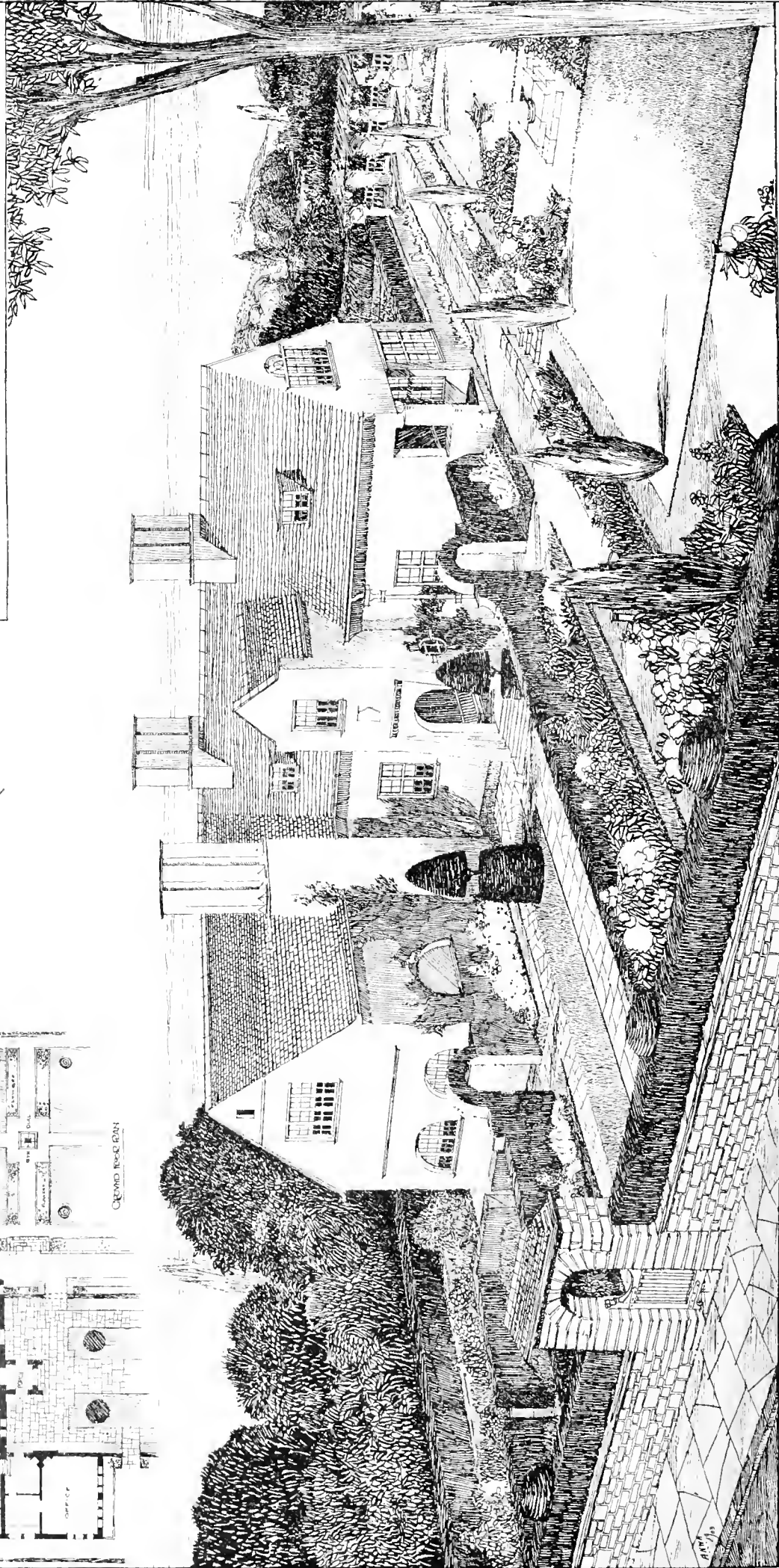




A SMALL HOUSE AND GARDEN
AT WINDERMERE
BY ROBERT R. MASON, ESQ.



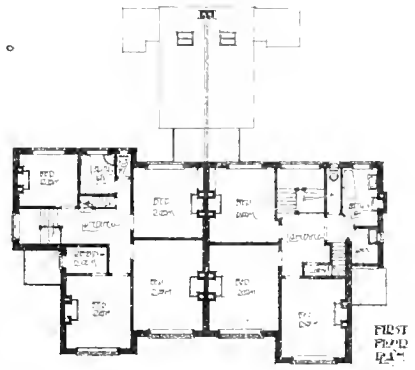
GROUND FLOOR PLAN



View towards Lake Windermere

THOMAS H. MASON • 25 CONDUIT STREET W. •

• VILLAS PRENTON CHESHIRE •
T. TALIESIN REES · FRIDA ARCHT



• ALPHA LODGE PARKGATE CHESHIRE •
T. TALIESIN REES · FRIDA ARCHT



THE BUILDING NEWS

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FRIDAY, SEPTEMBER 25, 1903.

INDEPENDENT PARTY-WALLS.

ONE of the restrictions of modern town building is that imposed on all building and adjoining owners by the statutory enactments relating to the repair, pulling down, and rebuilding of party structures which are defective. The obligations incurred on these persons are set out in the London Building Act in Part VIII., sections 87, 88, 89, 90, &c., to which we need not refer. Only the back and front walls of a street building can be treated as the owner likes; the other sides, often, the largest in superficial area, are division-walls, and are held in common between the owners, so that practically more than half the exterior of a street house is lost for architectural effect, and as the back wall counts for little, the external design is really limited to one narrow frontage as a rule. We cannot perhaps therefore be surprised if the façade of a street building receives so much attention as it does in the way of ornament, as it is the only part of the structure visible to the public, although a good deal of the design becomes thrown away in narrow city streets. But we are not now discussing the architectural question, but the structural one of party-walls. The question is whether the owner of a building in a street who rebuilds his premises is justified in erecting an entirely new wall or walls on his own land, or is compelled to give the usual notice under the London Building Act, and to rebuild the wall as a party-wall between the properties, each party paying one-half of the cost of rebuilding? An interesting case we reported in our Legal Intelligence column last week, which is of considerable importance to building owners. The owners of premises in Bouverie-street, a publishing company, rebuilt their offices in 1898, and, instead of giving the usual notice under the London Building Act of 1894, and rebuilding the old party-wall which divided their property from the next, they built an entirely new wall situate wholly on their own land. Eventually the adjoining owner followed the example of the publishing company by pulling down his premises, with the intention of rebuilding them; but the surveyor acting under the Corporation of the City of London served a notice requiring the old party-wall to be pulled down, on account of its dangerous condition, and it was agreed between the parties that each should pay one-half of the cost of demolition. There was no dispute on this point; but the adjoining owner proposed to rebuild the party-wall on its old site, and served the usual notices under the Act, and sought to make the company contribute one-half its cost. This they refused to do, as they had already rebuilt their premises in a substantial manner on a new wall standing on their own land. The proposed new party-wall, they argued, would be of no use to them whatever, that they did not intend to use it in any way, and they relied on this point to relieve them of any liability. The question was thereupon referred to arbitration, and the arbitrator in his award decided that each party should pay one-half of the cost of rebuilding the wall. Against this decision the present appeal was made. The judge, after hearing counsel on both sides, upheld the decision of the arbitrator, and in giving his judgment said, "That, notwithstanding the fact that the company did not intend at present, or at any future time, to use the wall, nevertheless there was nothing to prevent them doing so, and he did not

think it was arguable that they should have this swinging right, unless they contributed to the cost of the wall. He said if the matter was decided otherwise, he could conceive the case of a similar thing being done through sheer spite, thereby imposing a great and unnecessary burden upon the adjoining owner, although there was no suggestion of anything of the kind in this case." We do not see how any other legal decision could have been come to in justice to the adjoining owner; for if any building-owner had this power the definition of the term "party-wall" in the Act would be rendered meaningless and the sections inoperative. The definition is now (a) "a wall forming part of a building, and used, or constructed to be used, for separation of adjoining buildings belonging to different owners, or occupied or constructed or adapted to be occupied by different persons; or (b) a wall forming part of a building, and standing to a greater extent than the projection of the footings on lands of different owners." But there has been a great deal of controversy over the meaning of "party-wall," and it has been used in different senses. (1) A party-wall may mean a wall of which the two adjoining owners are tenants in common, and this is the primary meaning to be attached to the term; (2) it has been used to mean a wall divided into two longitudinal strips, one belonging to each of the adjoining owners; (3) it may mean a wall which belongs entirely to one only of the adjoining owners, but subject to an easement or right in the other to have it maintained as a dividing wall between the two tenements, and in this sense it is often used in the Building Acts; (4) it may mean a wall divided longitudinally into two moieties, each of them being subject to a cross easement in favour of the owner of the other moiety. According to the first of these definitions, the provision of the Act appears to have been framed. But it is a question of "user" chiefly; the Building Act is intended to limit the acts of private owners for the good of the public, to prevent the spread of fire chiefly, and for the purpose of physical separation, and these are the main objects which the sections of the Act are intended to promote. The rights of ownership are not the main consideration. Before the Building Act came into operation, the dividing walls of buildings in streets were of various thicknesses and materials; the buildings of Old London have revealed stud-work and plaster, brick-nog partitions, and walls of all kinds of construction, which rendered easy the spread of fire. It was with the object of providing substantial party-walls of brick of minimum thickness that the Building Act was framed. So long as there was a good thick wall between the houses the requirement is practically met, and therefore the definition No. 3 above would be sufficient to meet the case. But for economical reasons a wall-constructed equally on both sides of the dividing line between two premises was naturally regarded as the most desirable arrangement, in which the adjoining owners are tenants in common, a wall bonded throughout its thickness. A wall divided longitudinally into two strips, one belonging to each of the tenants, or as in definition 4, would necessarily imply two walls placed close together without a through bond, and therefore defective in strength. In the case of one strip or half belonging to each owner, it would be possible for one of them to be taken down or tampered with at the expense of the remaining moiety.

If we consider for one moment the question of an independent wall on land belonging to one of the parties and exclusively his own, in an architectural sense there is something to be said in its favour. It can be built without any reference to the requirements of the adjoining owner, and if such a wall is carried up to a greater height than the roof of the

adjoining building, it can be treated architecturally and become an integral part of the building. Thus it can be divided into panels of brick or stone or of different coloured materials. The cornices and stringcourses of the front face could be returned along the sides if space allowed, for it would then become an external wall. But in such a case the adjoining premises must also have a party-wall of its own, which would have to be built, presumably, at the sole expense of the owner. There would then be two thick walls where one of a certain thickness would be sufficient. The Building Act interposes to prevent such a double wall being erected, by providing certain scheduled thicknesses for walls of different heights, and requiring each party to pay one-half of the cost of building it. Thus the cost is equally divided between the adjoining owners without sacrifice of room. The construction prescribed by this Act renders such a common party structure perfectly safe. Thus it is required that no bond timber or wall-plate or wooden beam or joist shall be built into any party wall nearer than 4in. from the centre line of party-wall, that every bressummer bearing upon such a wall is to be carried by a templet or corbel of stone or iron, tailed through at least half the thickness of wall. Again, if premises were divided by two-walls, each belonging to the adjoining owner, the walls so built could not be termed party-walls in the sense defined in the Act, and there would be a frequent violation of these requirements by builders. There are obvious reasons for upholding the statutory provisions, and for not sanctioning any building owner to construct a party-wall on his own land independent of his neighbour, with the object of evading his obligation to pay for his neighbour's party structure when it was found necessary to rebuild it, even though such party-wall was not intended to be used by the building owner. The case we have quoted will be a useful reminder to all owners of property who have obligations to fulfil, and who intend to rebuild their premises.

FRENCH AND ENGLISH METHODS OF DESIGN.

OCCASIONALLY it is useful to compare our methods of professional practice with those of other countries, as we are so apt to become insular in our habits and prejudices. We need not surrender our nationality by taking advantage of improved methods and adopting those of other countries, but we are more likely to lose our distinctive habits by accepting blindly and without consideration the styles of other nations. For instance, there may be a good reason for adopting a system of education which has worked well in Germany, France, Switzerland, and the United States, though for us to adopt their fashions of dress and tastes in building and other matters is a very different matter. The latter step implies that we have no tastes of our own, for these express the national sentiment, while the methods of education do not. To take an illustration more appreciable to our present argument, we can adopt a foreign system of construction and manufacture with advantage without committing ourselves to the particular style of architecture which is associated with it. In the engineering industries it has been irrefutably shown that we are behind America and other countries. The system of training engineers which prevails in the States is more logical and discriminative than our own, for tradition, family connections, and money are less influential; the pupil is encouraged to develop his natural abilities or particular bent, instead of being made to undergo the routine of an office in which almost everything is drummed into the pupil but the right one; that for which he has shown ability. In America capital is made out of the natural

talent of the pupil. The engineering assistant is even better looked after. The youth who, after paying a large premium to a London firm to learn the business, is cast adrift after his term of articles has expired, finds often his talents appreciated and adequately rewarded in the United States, where he is put to his right occupation, and obtains a higher wage. The American method of teaching engineering is more systematic than our own; the college training is perfect. Even in architecture, the improvement manifested in all that concerns design as applied to buildings has been remarkable. Not so long ago American architecture, if it could be so called, was a reproach, a bad imitation of our 19th-century revivals; now the buildings of the great cities vie with our own in architectural treatment and good taste. The architects in the States have learned much from the Mother Country as well as from French methods; indeed, many of their leading men have been trained in the Paris ateliers, and are imbued with French methods and tastes. The report published not long ago, drawn up by leading men in the profession on French and English design and draughtsmanship, revealed some of our shortcomings, the lack of the study of composition and modelling, light and shade, which can only be acquired by the study of the plan of a building. Greater attention is bestowed in France on the composition of the plan of the building. The instruction in architecture given at the Ecole des Beaux-Arts, Paris, was described by the late Mr. Arthur Cates in the *Journal* of the R.I.B.A. These consist of competitions (*concours*) in architecture, divided into analytic exercises (studies of details) and composition; competitions in scientific subjects; the study of ornament and modelling. The competitions in composition or design comprise sketch, plan, section, and elevation of a given subject. These embrace all that is essential in architectural composition. In draughtsmanship the French architect, though less given to picturesque effects, is more technical and correct, especially in the art of shading and perspective, as these are subjects which form a special branch of the course of instruction.

Architectural design in France is regarded from a rather different point of view than it is in this country. It is looked upon more as a whole—an *ensemble*—than in a piecemeal manner. The Englishman is so essentially practical and detached in all he does that he can seldom bring himself into the frame of mind to view his building as a whole—an artistic composition subserving useful ends—he rather regards the useful ends as distinct and without reference to the design in its completeness. He studies his plan first, often without reference to his elevations, which are made to agree afterwards; or he thinks of his elevations, and makes his plan fit just as he pleases. The plan and other drawings are studied too much separately. The French architect is more of a scholar and an artist than a practical man. An interesting paper published in an American professional paper some time ago gave an instructive insight into the mode of designing adopted in France. We quote the following by the author of the paper, M. Alb. Allain:—"When an architect is consulted with regard to a work of architecture, he should be able on the spot to design mentally one or even several projects of the structure in question, in accordance with the intentions of the person who wishes to build. This mental design makes it possible for him to propose at once to the owner, one or several types of structure for the proposed building. When the first general understanding has been arrived at, the architect makes a sketch, a rough tracing with the pen, indicating only the *ensemble* and the principal divisions, serving as a basis for the execution of the real design or the final project. The architect should be able with his sketch to give an approximate estimate of the expense,

based on the cost price per mètre (or foot) of surface and per floor for a structure of the character ordered. When client and architect agree on the *ensemble* of the structure and its essential points, the architect starts on the execution of his project. He first draws his design with pencil, and on a reduced scale. The simplest and most commonly used scale is one decimètre or two decimètres, in which one or several of the divisions as units of length are taken. If it is understood that one centimètre, two centimètres, five centimètres represent one mètre measured on the ground, we say that the design executed is on the scale of 0", 01, of 0", 02, of 0", 005 per mètre. The custom in France is to draw the plans at 2 centimètres per mètre." We may usefully remark on these observations that the French designer begins by grasping mentally the design of the structure as a whole or in thinking out one or more schemes, before he makes any sketch-plans of his proposal. This mental process of design should, of course, be in accordance with the intentions of the client. It is not the gift of everyone to be able to conceive mentally the kind of structure required, but the exercise of the faculties is not impossible. The first thing the average architect does when he gets a commission to design a building for any particular purpose is to consult examples, to search through plans and designs of buildings that have been erected for the same objects; such reference is not often conducive to invention. The English methods of teaching the profession do not aid the mind of the designer; they rather stifle inquiry and original thought by interposing precedents and traditional types. These have a restraining influence upon him. The course adopted in France is systematic. The architect would have to invent his plan from his own brain—he would not have recourse to other plans; but such ideal architects are rare. The plans are first drawn in pencil, and these are chiefly constructional, consisting of the axes of walls and rooms, and are drawn in interrupted lines—a series of dashes and dots, and dotted lines are employed to indicate the concealed lines and outlines. Afterwards the plan is drawn in with ink, and the pencil lines erased. Our way of proceeding is less methodical in its procedure. The architect makes a rough sketch to scale of the requirements, which, if approved, is at once drawn out, and the elevations prepared to suit. But probably there are several alterations required which completely upset the original design, and render a new scheme necessary, or a fresh set of plans, a system which does not bind itself to ideal compositions, or to that study of *ensemble* which is necessary from an artistic point of view. Again, it is stated when the French client and architect agree on the *ensemble* of the structure and its essential points, the architect begins to execute his project by drawing his design in pencil on a reduced scale. The English practitioner is supposed to proceed in much the same way; but many hindrances prevent. In the first plan, the architect and client do not trouble about an *ensemble*; the latter considers chiefly his requirements and the cost. And these are prevailing. Then, few architects are in the habit of drawing the first design to a reduced scale, unless the work is of an important kind, requiring several studies. Many adopt for small buildings a scale of $\frac{1}{16}$ in. to the foot, which can be traced and made to answer for contract working drawings.

The same writer says: "To express the design the architect must represent in form of a plan, a profile, and an elevation, the building which is to be erected." These three drawings are necessary to express the general design or *ensemble*. Great importance is attached to the plan, as on its composition the merit of the work depends. But in this country we do not study plan as the French architect does. We look upon it as merely a

matter-of-fact draft of the arrangement; as a necessary and practical means of showing the requirements, without any reference to its *composition*. It is the composition of the plan, by which we mean its general outline and grouping, that the French consider mainly. "The skill of the architect," he says, "consists in combining the convenience of the interior connections of the necessary exits with a regularity which is always desirable; but to this regularity, to symmetry, to the uniform correspondence between all the parts of a plan he must not sacrifice everything else. It is necessary above all that the general and special arrangement agrees with the needs and the use of the building." All this we can cordially agree with. The plan must subserve the wants of its occupants; but at the same time it should be put into shape. There ought to be observed, where possible, axial arrangements and a correspondence of parts externally if a regular composition is desired. But composition in plan must be suggested by the choice of idea, on which the form of the building or its physiognomy and character depends. Profile is not less necessary as a part of the *ensemble*, but is often left to chance by many architects. The French architect considers it as an important part of his composition. Having satisfied ourselves with a plan that will work, and elevations that will fit and will look well, we do not trouble; we draw our sections without any attention to profile. But how much depends on it? We may see its neglect in the unsightly profiles and skylines of many of our London buildings. We do not study our sections so carefully as we might; they are too often looked upon as irksome constructional details that can be drawn after all the other drawings are prepared, just for the purpose of contract. There are two main parts described by M. Allain in his paper—the design of a building in plan, profile, and elevation, and the representation of the ornaments which form its decoration, which are drawn to a large scale or full size. With these designs the architect has to furnish estimates and specifications. In the descriptive statements the French architect specifies, as we do, the materials, requirements, and processes necessary. The "*devis descriptif*" may be regarded as the specification of work; the "*devis estimatif*" concerns the cost of each detail. The "*devis*" has to show in a precise manner the perfected building in its *ensemble* and its parts, the nature of the materials to be used, their quality, the processes to be used to insure perfect execution, &c. In fact, the "*devis*" specifies everything necessary; the architect also describes in it the arrangement and decoration of the several rooms shown in the drawings. A methodical classification is necessary to avoid overlapping, and the "*devis*" is divided into divisions of the trades, as in our specifications. Each trade or class of work is thus described; but the most careful attention does not insure always correctness against error. These involve, as in our practice, variations in the amount agreed upon. The writer says, "To avoid this, in order not to be bound irrevocably, we often suppress the '*devis estimatif*,' and retain only the '*devis descriptif*,' after the owner and his builder are sufficiently posted regarding the cost. On the whole, in France, the work of the architect consists in furnishing the project, involving a more or less large number of designs, and the '*devis*.'" He is also responsible for damage caused by faulty design or specification. The composition of plan is one of the distinctive merits of a great architect, and, as the author whom we have quoted, remarks, "A good architect need not consult any work on architecture, because, no matter what problem may be before him, he will at once see, in his mind's eye, a standard plan of his building. I mean to say, the disposition and the

distribution proper for the building, the best order and the best arrangement so far given to such and such details, and to its *ensemble*. If by chance the architect should not have the standard plan in question present in his mind, he should be advised to look it up, either in technical books or in the works of his fellow architects. There are standard plans for all kinds of structures, from the standard plan of a labourer's cottage to the standard plan of a church, from the standard plan of a theatre to the standard plan of a hospital, and we may lay it down as a principle that the architect before composing the plan of his building must know the standard plan of that kind of building, and must not let it pass out of sight—unless he is a man of genius. Of course, he must not copy it; besides, it might be that the standard plan would not answer sufficiently well the particular wishes and taste of his client. . . . In one word, there must be in the mind of the architect a sort of mysterious collaboration between the architect's own conception, the requirements of his customer, and the standard plan. From this triple collaboration the composition of the plan of the building will originate." The author goes on to describe the order adopted in France in designing. This corresponds practically with our own: the plan of the ground floor is the first, then that of the first floor, then those of the other floors, and last the basement plan and upper part; two sections are made, as with us, and finally the elevation of the front. The remarks on the design of the elevation and the details are perhaps more true of French modern architecture than of English. The French architect is a skilful decorator; he studies ornament specially, but is apt to exaggerate its importance. Reliefs without motive, senseless balconies one above another, columns on the balconies, brackets suspended anywhere, are noticed as common mistakes in the French façades. Instead of which the ornament should be based on motives derived from the structure of the building. And yet ornament is the complement of architecture of a certain class. There are two classes of architects in France—those who content themselves with the ordinary and humbler kind of structure, and those who devote their attention solely to important works.

THE ARCHITECTURAL ASSOCIATION'S ANNUAL REPORT.

THE annual "brown book" of the Architectural Association has just been published. It contains much information as to the curriculum of the classes, a list of members, a syllabus of meetings, &c. The report of the committee for the session 1902-1903, states that the 56th session of the Association, which ended on May 31, 1903, has been one of successful progress in every respect. The membership again shows an increase, and at the close of the session numbered 1,512; 136 new members were elected, 15 rejoined, and the number of losses by death, resignations, and other causes amounted in all to 29. The committee regrets to record the deaths of Professor T. Roger Smith (hon. sec. 1859-60, and president 1860-61 and 1863-64), a constant and active friend of the A.A. to the last, and Messrs. A. G. Morten and J. J. Trego. The question of new and adequate premises has again received earnest attention, and a proposal having been made by the council of the Royal Architectural Museum, Tufon-street, Westminster, that the Museum and School of Art, together with the existing leases, should be transferred to the Architectural Association, the committee considered the proposal in all its bearings, and subsequently by the unanimous vote of members at a special general meeting held on November 24, 1902, the committee were empowered to accept the offer with thanks, and to carry the matter to completion. The affairs of the Royal Architectural Museum were in due course wound up, Mr. William Pain having been appointed liquidator. The committee found it quite impossible to arrange for the Westminster School of Art to continue its valuable work at the Museum, as the Architectural Association would require all the accommodation for its own needs. Arrangements were made to allow the school to continue until the end of June, 1903, thus entitling the school to the full grants payable by the Technical Education Board and Board of Education, formal possession being taken on July 2, 1903. The committee desire to acknowledge very gratefully the services of Mr. Maurice B. Adams, who for many years acted as hon. secretary of the Royal Architectural Museum and Westminster School of Art, and with whom the proposal originated that the premises should be transferred. The lease of the present premises at 56, Great Marlborough-street, terminated on Midsummer Day, 1903, but arrangements have been made for occupation to be continued until Lady-Day, 1904, by which date it is hoped the Architectural Association will have removed to Westminster. Negotiations are in progress for a lease of 999 years in place of the existing leases of 73 and 23 years respectively. Important alterations were found to be necessary to adapt the premises and obtain the full advantages of the site. Mr. Leonard Stokes has been appointed architect, and the tender of Messrs. Holloway Brothers (£8,440) has been accepted. Contributions are invited towards the Building Fund, as a large amount is still required in order to carry out the alterations and provide the necessary equipment.

The progress of the Day School has been very encouraging both in regard to numbers and work. The term of Mr. Arthur Bolton's appointment having expired, the committee have appointed Mr. H. P. G. Maule as his successor. General regret was felt that Mr. Bolton was unable to continue to fill this post, which he had held for two years with the best possible results, but private practice compelled him to relinquish the work. The same reason was responsible for Mr. E. F. Reynolds's resignation.

The balance sheet and general income and expenditure account show that the past session has been a satisfactory one financially; in no single instance have the receipts shown a decrease compared with those of the previous session.

The annual excursion, which was organised by Messrs. W. Talbot Brown and A. W. Hennings, took place in July, and was attended by 28 members, Banbury being the headquarters. Two hundred and fourteen individual students attended the studio and evening classes, the numbers showing an increase over the previous year. The classes of design were very successful, and the visitors spent much time in inspecting and criticising the various designs submitted.

SANITARY WOOD BLOCKS IN STREETS.

AT one of the closing meetings of the British Association at Southport, Mr. W. Powell, of Liverpool, read a paper describing the preservation, seasoning, and strengthening of timber. He endeavoured to show how some kinds of timber, at present valueless, might become exceedingly useful; how timber used for structural purposes might be so strengthened as to bear a much greater load or strain; how streets might be cheaply paved with sanitary wood blocks which would neither absorb surface water nor give out disagreeable effluvia; how we might combat the ravages of dry rot; and, finally, how to do all this simply, naturally, and at comparatively small cost. By boiling timber in a thin saccharine solution until most of the air in the timber was exhausted, and then, by leaving the wood in the syrup to cool, a certain amount of sugar was absorbed by the timber, in some cases so much as to cause the timber to sink. After the wood had become sufficiently saturated, it was put into a drying stove and the moisture driven off at a fairly high temperature until the wood was thoroughly dry, ready for immediate use. That process differed from others mainly in the fact that, before drying was attempted, the interstices of the timber were filled in with a viscid, glutinous solution, which took the place of the natural sap and air which the wood had been forced to part with, and so, when the moisture was driven off by stoving, the sugar which remained in the wood acted like a strong binder and held the fibres together, just as cement or mortar bound the stones or bricks in a wall. There were thousands of square miles of land in the States and Canada covered with timber which, at present, was of little commercial value. This class of timber was especially amenable to the Powellising process, and the

results were astounding. Very remarkable results had recently been brought out at Silvertown, where some timber processed showed the following results in increased strength:—Pitch pine from 14 to 32 per cent., white pine from 29 to 39 per cent., yellow pine from 56 to 107 per cent. If this simple process increased the strength of yellow pine from 50 to 100 per cent., then it followed that such timber would be able to bear a corresponding greater strain, or that 25 to 50 per cent. less timber would be required to bear the same strain. The question as to the effect of the process on the flammability of wood—especially of such wood as the pines—has naturally arisen, for many persons imagined that, because sugar was introduced into the timber, it would become more inflammable. A little reflection, however, would show that the reverse would be the case, which, indeed, was borne out by tests. Timber, properly processed, would stand very high temperature in drying, and be all the better for it; but each class of timber naturally required modified treatment in each stage of the process. In all timber, and especially in walnut, oak, beech, birch, maple, mahogany, &c., where there was feather or grain, the process brought out the ornamental character of the wood more distinctly; and thus even some of the commoner woods might be used for ornamental purposes, as the appearances when cut and polished were so much improved. By this simple and inexpensive process it is probable (1) that some varieties of timber not at present merchantable, especially some kinds growing in Canada and the United States, might be made of considerable commercial value, and thus an important addition be made to the world's stock of useful timber; (2) that such timber might possibly furnish an ideal paving block, at once cheap, tough, and sanitary; (3) that the lighter timbers used for structural purposes might be made to bear much greater strain without increasing their weight appreciably, and at the same time be rendered less inflammable and impervious to the attacks of dry-rot; (4) that hardwoods, such as beech, birch, elm, ash, maple, mahogany, &c., had their valuable qualities enhanced, their liability to split or crack diminished, their appearance when polished or varnished much improved; and (5) that timber might be rapidly dried and seasoned, and thus an enormous amount of capital now locked up might be realised.

IMPERVIOUS CONCRETE.

THE great value of concrete in modern construction is a fact beyond any doubt. In our own day the progress made in the manufacture and use of concrete in hydraulic works and building has been remarkable. The variety of its applications has been equally significant;—from foundations, bridge pier, and dock wall construction, it has been employed in superstructures of all kinds, arches and vaults, floors and domical roofs. For sewers, subways, and reservoirs it is now in constant demand as a substitute for brick and masonry. We use it for our fireproof floors, our pavements, and streets. It is now no longer confined to the structures of the engineer, for the architect is constantly bringing it into requisition in a variety of ways. But there are certain questions concerning it that we require to know more about: its imperviousness to water, its action when combined with iron or steel, its fire-resisting qualities, &c. An informal discussion on the subject of "Impervious Concrete" took place recently at the Annual Convention of the American Society of Civil Engineers, a full report of which is given in the last month's *Proceedings* of that Society. The subject for discussion was, "Is it possible to make concrete which will be impervious to water? If so, what is the best method?" The remarks of R. W. Lesley, Assoc. Am. Soc. C.E., show a thoughtful investigation of the subject, the author referring to the valuable researches and experiments of M. R. Feret, Chief of the Boulogne Laboratory of the *Ponts et Chaussées*, an eminent expert of the French Government. The results of his experiments, begun in 1887 and pursued for five years, can only be summarily given in Mr. Lesley's own words: "(1) The strength of mortar made on ordinary public works increases in proportion to the amount of lime or cement therein. (2) The strength increases generally at the beginning of the hardening, in proportion to the size of the sand elements. (3) Mortars made with a mixture of sand containing large and small particles present practically the same advantages

as those where sands of large particles are used exclusively, and should be preferred to the latter.

(4) The porosity of cement mortars varies greatly. It diminishes as the proportion of cement increases. It is much greater when the sand is finer. (5) The permeability of mortar diminishes as the proportion of cement is increased; but reversing the conditions applying to porosity, permeability increases according to the size of the sand grains. Mortars made with sand composed of different-sized particles which themselves have little porosity also very slight permeability." It is also observed that the permeability of mortars submitted to a continuous filtration of fresh or sea water diminishes rapidly with time; and it is recommended to mix mortars to a good consistency by adding too large rather than too small a quantity of water. M. Peret, in referring to the porosity of mortar, observes, the most porous mortars are the least permeable, and the reverse applies to permeable mortars. Permeability is quite different from porosity. The passage of water may be said to free small particles of lime or cement and bring them to the surface, where they produce efflorescence according to the freshness of the mortar. This efflorescence tends to solidify the mortar and form an exterior coating. Tables are given to illustrate by experiment the effect of water passing through the permeable mass, which demonstrate that when water is forced through a mass of mortar, stone-work, or concrete, the quantity that goes through the first hour does not indicate any want of value in the mortar, as the water carries lime particles which close the pores. Each subsequent hour shows a diminished volume of percolation. The tables represent the lessening of permeability by the pores becoming closed by the carbonates of lime. This is due to the limewater attacking the cement and the exposure to the air. It was, indeed, found by experiment that the ratio of the permeability of the mortar increases as the quantity of water increases, or as the filtration through the mass is more abundant. These experiments were confirmed by Durand-Claye, who enunciates the principle that for each class of mortar and sand there is a definite dose of water which corresponds to the maximum of compactness and the minimum of permeability of the mortar. M. Peret, in summing up the subject, says "that in all mortars of granulometric composition the most permeable are those which contain the least quantity of cement. Of all mortars of the same richness, but of varying granulometric composition, those which contain very few fine grains are much more permeable." They are more so, he found, where the coarse grains predominate; and the minimum permeability is found in mortars where the proportion of medium size grains is small and the coarse and fine grains are equal to each other. These conclusions are what we might have expected, and also the other deduction referred to by Mr. Lesley—that neat cements under pressures of 75 to 200lb. per square inch showed no permeability to water in 28 days, but that with sand the permeability increased as the sand was increased. In fact, the mixture of 1:1 gave better results than the 2:1 samples. Another conclusion drawn from experiments made by Messrs. Hyde and W. J. Smith, noticed in the *Journal of the Franklin Institute*, is that all cements are not permeable to water, at least for thicknesses of not less than 3in., while the mortars are all permeable, the amount increasing with the pressure, and decreasing with the age of specimen. They show also that a conduit of *béton-agglomère* composed of sand and cement was practically impermeable. The porosity of mortar depends on the voids of three kinds, those existing between the grains of sand or pozzolana and not filled up by the cement or lime, those due to the air which adheres to the grains, and those left by the evaporation of the water used in the mixing. Each kind of void was investigated, and the conclusions come to were that cement mortars are less porous than those made of hydraulic lime and sand; that cement mortars made with coarse sand are less porous than those made with fine sand; that neat cement mortars are more porous than those mixed with sand, &c. The author of the paper proves indeed from these experiments that the permeability of mortars, so far from being a consequence of their porosity, is, in fact, almost inversely proportional to it.

We cannot refer here to other investigations. The general drift proves that fine sand mortars are less permeable than those of coarse sand, and that permeability decreases as the proportion of

cement increases; that neat cement is the least permeable of all. "That concrete made with 700lb. of Portland cement, 1 cubic yard of mixed sand, and 1½ yard of small gravel, and moulded in the shape of a hollow cylinder, with a shell of 2½in. thick, was impermeable under a head of water 13ft., while a mortar made with the same amount of cement and sand, but without gravel, and moulded in the same shape, was somewhat permeable."

The permeability of concrete under high water pressures has also been carefully investigated. The pressures were 20, 40, and 80lb. per square inch, and the time of test two hours. Two brands of Portland cement were used, and mortars of 1:1, 1:2, 1:3 of sand were made. Several of these mixtures were impermeable to water at the pressures named. All the specimens made with the first proportion were impermeable, and some of those of the second class. In short, the experiments showed that neat cement mortars are the least permeable, and that those with fine sand are less permeable than mortars with coarse sand. Mr. Lesley's theory, based upon experiments and upon those of Peret, indicates that the least addition to cement mortars for the purpose of making them impermeable, according to theory we have noticed, would be "to add to the concrete at the time of mixing a certain proportion of hydrate of lime, or, in other words, the ordinary slaked lime of commerce." Such an addition, the author says, does not injure cements or mortars, nor cause expansion, and does not decrease their strength. This lime would form a substance which would be carried by filtration and close the pores, form efflorescence or stalactites on the surface. Other papers are contributed on the subject, to which we may refer. Mr. J. James R. Croes, past president of the society, observes that it is easy to make concrete impervious to water, which is a different thing to making it impenetrable. The latter requires only the application of an impenetrable coating to the surface. A small mass of concrete can be made impervious to water; but the difficulty is in uniting a number of such small masses in such a manner that the joint will be impermeable also. There is a practical difficulty in securing the proper combination of the materials to render the mass impervious to water. Like masonry, concrete made in different quantities and mixtures is liable to have void spaces, and thus to render a large mass of concrete pervious to water. The author refers to the application of the Sylvestre process, invented sixty years ago, or a mixture of soap and alum applied to the surface of brick. The pores are filled up by the addition of these ingredients, which were mixed up in the mortar itself, and the chemical action which takes place in the interior of the mass seals up the pores and renders it impervious. Mr. J. W. Schaub, another member, remarked that all that was necessary to make concrete impervious to water is to wash the walls inside with grout, or two coats of neat cement grout. This coating on the inside of a cistern will hold the water in the cistern, but will not affect the outside. To render both sides impervious it is necessary to apply the grout to both the inside and outside. For greater pressure than 10ft. head, grout is not sufficient, and asphalt applied hot with a mop until a coat of ¼in. covers the grout is declared to be satisfactory. We may refer to other contributions on this interesting subject, which has a very practical interest for the profession generally.

"BUILDING NEWS" DESIGNING CLUB: AWARD OF PRIZES, 1902-3.

"ALL BRITISH" wins the first prize easily for his work during the last session of our Club: "Solo" comes in thoroughly well as a good second, and "Brassey," who has maintained a sincere endeavour from start to finish, takes the third place. "Icele" ranks fourth, "Last Man In" fifth, and "Red Rose" sixth.

The first prize of £10 10s. is accordingly given to "All British," Mr. Philip H. Ellis, 20, Shakespeare Villas, Nottingham. The second prize of £5 5s. falls to "Solo," Mr. S. J. Waring, 16, Highfield-street, Leicester; and the third prize of £3 3s. to "Brassey," Mr. F. E. Tabberer, The Holt, Leicester. Hon. Mention is accorded to "Icele," "Last Man In," and to "Red Rose."

The record of the above successes during the nine monthly competitions held from October, 1902, to June, 1903, is as follows:—"All

British" was five times first, once second, and three times third. "Solo" was once first, four times second, twice third, and once sixth. "Brassey" was once second, once third, once fourth, once fifth, and twice sixth. "Icele" was once first, once fourth, and once sixth. "Last Man In" was once first, once fifth, and once sixth. "Red Rose" was once second, once third, and once fifth. "Clay Pipe" took a first place once, but this was the sole occasion on which he came in among the first six. "All British" took a place in each of the nine contests.

The subjects set for the past Session were these:—

- A.—An Artist's Town House.
- B.—A Country Vicarage.
- C.—A Hill Side Church.
- D.—A Village Market Hall.
- E.—A Roundhouse in the Country.
- F.—A Co-operative Store for a Village.
- G.—Sanatorium for Consumptives.
- H.—Tavern and Cottages on a Goose Green.
- J.—A Band Stand and Refreshment Pavilion.

SESSION 1903-4.

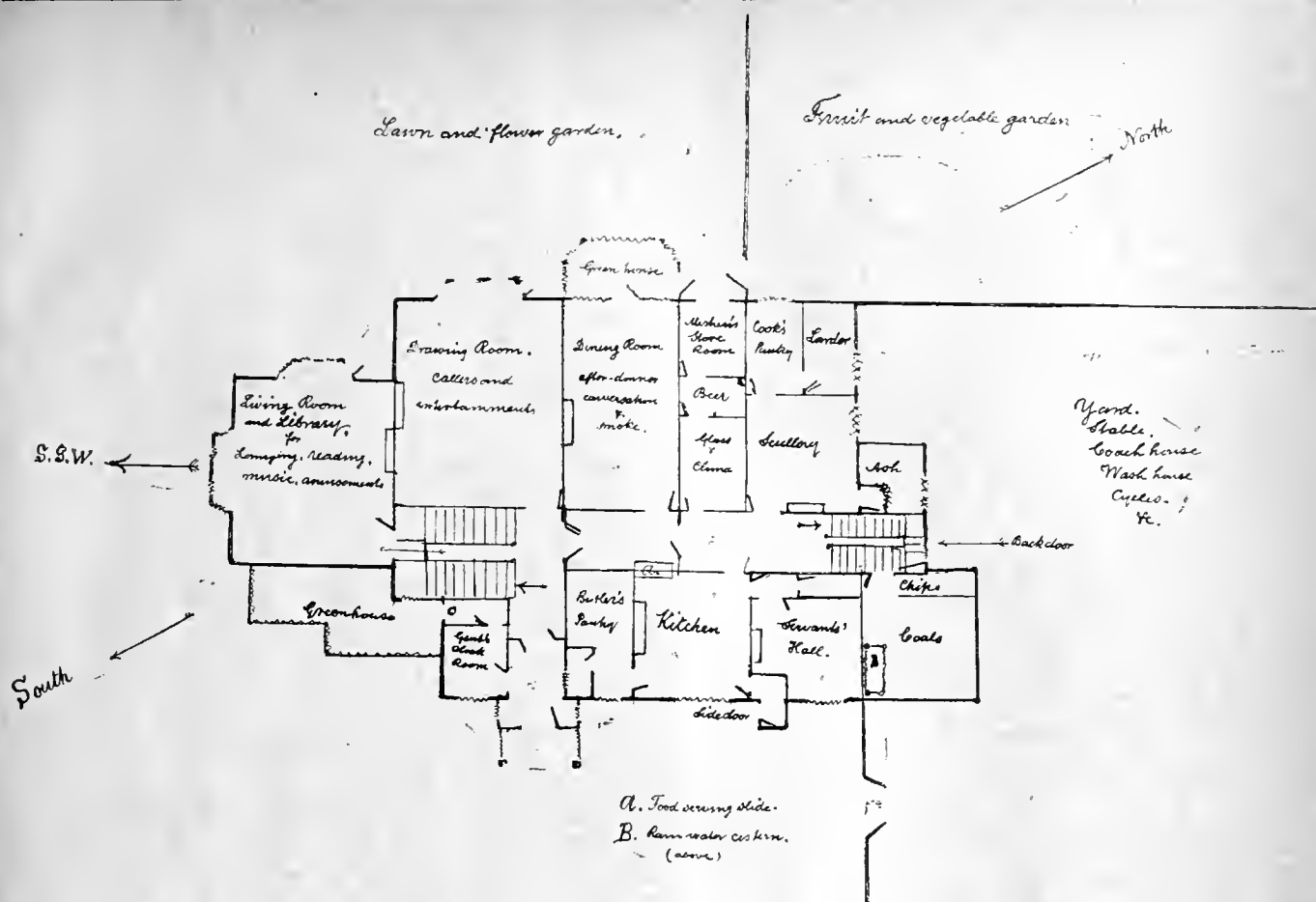
FIRST COMPETITION.

A.—A Secondary School for 150 boys, on an open site, with a frontage towards the south-east, facing the high street of a country town, in a freestone district. The playground will be at the rear, and the land falls 1 in 12 from S.E. to N.W., commencing at a distance of 20ft. from the street footway, where the site is level. The building is set back 15ft. from the street. The accommodation is to comprise an assembly-hall 50ft. by 25ft., and five classrooms, about 22ft. by 20ft. each. A chemical laboratory for twenty students, a preparation-room, and a balance-room; a physical laboratory, available as a lecture-room, about same area as the chemical laboratory; an art classroom for twenty students, and a small life classroom—both these to face north. A head-master's room, and a common room for the other teachers. Cloakroom for pupils, and latrines, lavatory, &c. Covered playground under part of the building, which is to be on two floors, above the ground level. Materials stone, and stone-slate roofs. Style simple and picturesque. Scale for the drawings 8ft. to the inch. A plan of each floor, two elevations and section, with a sketch view, which may be small. Drawings to be sent in so as to arrive at the office not later than October 31 next.

CLUB RULES FOR 1903-4.

The following are the rules to be observed by all who wish to join the club:—

1. Drawings to be sent within 28 days after the publication of the particulars of each subject.
2. One or more subjects will be given every month, from which a competitor may choose.
3. The drawing to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 24in. by 18in., unless an exception to this rule is named when the subject to which the deviation applies is set. No washes or tinting in colour whatever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts may be shown in ruled "etching," or blocked in. The scale to be used will be given with each subject.
4. Drawings to be forwarded, prepaid, unmounted, by post, care being taken to pack the roll so that the drawings are not crushed through the post.
5. On entering the class (which may be done at any time) each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being holdly marked on the front of each separate drawing.
6. Prizes of £10 10s., £5 5s., and £3 3s. will be awarded to the best series of designs. Our decision to be final.
7. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student. The same prize cannot in future be awarded more than once to the same student, and those who have taken the first prize cannot compete again.
8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.
9. A critical notice of the designs sent in of



DWELLING HOUSES.—SUGGESTED PLAN BY DR. JOHN W. HAYWARD.

each series will be given in an early issue following the receipt of the drawings. All drawings are returned when done with.

DWELLING-HOUSES.

By JOHN W. HAYWARD, M.D., late Vice-President of the Liverpool Architectural Society.

THE purpose of a house being to provide shelter and to protect from vicissitudes of the weather, it should be designed and constructed so as to serve these purposes without being prejudicial to health. The main purpose of a house being to live in, its principal feature should be a good family living-room. This should be large and designed for comfort, and should face the midday sunshine. As sunshine is the essential of health and comfort, the living-room should be so placed that its occupants will be exposed to the sunshine for as many hours of the twenty-four as possible. For this purpose it should face—or at least its principal window should face—the south, or rather the south-south-west, as shown on the accompanying plan. It should have two windows, one to the south-south-west and the other to the west-north-west. It is not a valid objection to this that sunshine spoils the colour of the furniture; the promotion of the health and comfort of the occupants is of much greater importance than the preservation of the colour of carpets, &c. This room should afford convenience for most of the requisites for comfort, instruction, and amusement, such as sofas, easy-chairs, books, musical instruments, &c., and perhaps for the proprietor's smoking. There should be a separate room for meals, the family to be called to these after the servants have laid the table and brought in the meal, and be able to retire to the living-room as soon as the meal is over, leaving the servants to clear the table. This will contribute to privacy, and to the avoidance of exposure to draughts from the kitchen. The family should not need to go into the drawing-room after meals. The dining-room should be simply for meals and for after-dinner conversation, and smoking. For callers and for social entertainments there should be a capacious drawing-room; it is not necessary this should have much sunshine. The drawing-room is not a room to live in; it is rather a night than a day-room, and

much sunshine would spoil the colours of its furniture. Still, neither the dining nor the drawing-room should be exposed to the cold of the north. These three rooms should be near to, and easily accessible from, one to the others; and they and the bedrooms should be efficiently ventilated. The living and the drawing-room should be easily accessible from the entrance-hall. The dining-room should be near to and easily accessible from the kitchen, and yet it should be protected from kitchen odours. Near to the dining-room there should be a small room for the mistress's stores, and another for the glass and china, and one for the daily wine and beer. There should be a lavatory with gentlemen's cloakroom on the ground floor; a ladies' cloakroom, and a lavatory with family bathroom on the first story; also a children's bathroom with lavatory on the second story; the water for these bathrooms and lavatories being heated in the boiler behind the kitchen fire. On the second story there should be also a housemaid's room and a bathroom, with w.c. for the servants, the water for these being heated in the boiler behind the scullery fire. In connection with the kitchen boiler there should be two cylinders, one placed in the family bathroom and the other in the children's, for the purpose of warming the rooms and drying the towels. There should be a small room for airing the newly-washed linen and for drying rain-wet clothes and shoes, &c. Clothes from the wash are not always sufficiently dried, and if wet shoes be sent into the kitchen they may be over-dried. This room may be heated by the cylinder in connection with the scullery fire, supplemented by an open fire or other means. There should also be two other small rooms, one to serve for the master's studio and to hold his deeds-safe, and the other for the mistress's boudoir and the jewelry-safe. There should, perhaps, be another to serve as a sewing and governess's room. The front door should be easily and quickly attended to from the kitchen and from the butler's pantry, the servants being usually in one of these. The scullery should be easily accessible from the kitchen. The kitchen and the cook's pantry should be at the north end of the building. The larder should be to the north or north-east, with the object of keeping cool and preserving the food supplies. As it is a gross mistake to have the family living-room

anywhere except to the sunshine, so it is to have the larder anywhere except away from the sunshine. There should be a servants' room near the kitchen, and a cook's store-room. There should be as many bedrooms and closets as possible, and as many of the bedrooms as possible should have a dressing-room, in order to keep out of the bedroom the offensive and unhealthy exhalations from the towels, sponges, flesh-brushes, &c., and for other purposes. And perhaps the master and mistress's bedroom should have two dressing-rooms and space for two beds. The room on the second story—that over the family living-room—should be appropriated for the children's living-room; that is, it should be the nursery, in order that the children may have the health-promoting and invigorating influence of the sunshine. The billiard-room should be easily accessible from the main staircase, and it should be on the second story; it should be thus placed in order that it may be lighted from above and be used as the principal smoke-room. The ground-floor space is required for the living, dining, drawing, and other domestic rooms; and, besides the smoke nuisance, there are other objections to its being near the drawing or dining-room. A supply of rainwater should be provided for. This may be done by a spout run along underneath the eaves to cisterns at the north end of the building. If carried on an ornamental ridge, this may be made quite a decorative feature of the exterior, even notwithstanding the presence of gables, &c. For the town water it will be well to have two cisterns—one to supply the family, and the other the domestics' part of the building. Any or all of the bays for windows may, if desired, be carried up to the bedrooms, or as exterior ornamentation. A small greenhouse at the south-south-east corner will help to protect the living-room from the cold.

ON BUILDING TIMBERS.—XXXVII.

OAK AND OTHER HARD WOODS.

THE concluding sentence of article XXXIV. on p. 233 of the present vol. of the BUILDING NEWS is, "All pollard oaks are hollow-hearted trees." To prevent misunderstanding it is necessary to observe that this statement must be taken in connection with the context, for if

isolated, it is not accurate, there being many apparently sound pollard oaks growing in private parks all over England. To lop the top of any tree is to "poll" it, and one so treated is then described as a "pollard"; it may be an oak, elm, ash, or any other tree. Pollard oak is well-known in the trade to be a dark brown richly figured wood, which is always cut into veneer, for the reasons already stated, its use at present being almost wholly confined to panelling furniture of a fairly good class; but architects can find no richer or more suitable wood in colour or grain amongst any imported for panelling first-class joinery where the stiles and rails are of oak. Pollard oak veneer with the best figure and darkest colour is invariably that cut from the wood of very old trees much stunted in growth and hollow-hearted. The statement referred to above may therefore be made more explicitly in this way. "All dark-brown, richly-figured, pollard oak veneer is obtained from hollow-hearted trees, and such wood is used for ornamental purposes only." It was always a maxim with old foresters that "Oaks made Pollards is quite wrong; for while the slow shoots are growing, the body of the tree is rotting." Removing large branches in polling a tree almost invariably leads to a decayed "heart," so that any statements as to the soundness of a pollard oak of any size should be received with caution. When English oak timber was in greater demand than it is at present, various schemes were elaborated by amateur woodmen for producing a great weight of good merchantable wood in a short time, and at a small cost. High cultivation and manuring were suggested as means to attain the desired end, and these were fairly successful; but the timbers so produced were not as durable as that grown more slowly in suitable soil and in the ordinary way, for culture had the effect of making the annual rings wider, and the wood softer than that which was grown in a wild or natural state. The oak of Central and Southern Europe, which grows faster than English oak, is softer and milder in working than the latter, and the oak grown in the Welsh and Scottish mountains is much harder and closer than that grown in England; but it seldom attains one-fifth the size of the best English trees. There is a well-marked difference between the hardness and durability of Scotch Highland oak and English oak, where both are subjected to much "wear and tear" and exposure to the weather, and North of England oak is harder than that grown in Herefordshire and farther south, for all slowly-grown trees of the same species yield harder, heavier, and more durable wood than trees which make timber rapidly, no matter from what causes, and these may be climate, soil, and exposure to light and air, whether in hedgerows, parks, or forests. All trees which yield building timber thrive best and produce the most valuable woods when they grow in soils and under climatic conditions natural to the species. Those which have propagated themselves in ancient woodlands and forests have a rate of growth conditioned by their surroundings, and any treatment which tends to develop the wood unduly or abnormally must injure the quality of the timber. Whatever tends to interfere with the natural development of the tree by increasing its growth will tend to the formation of annual rings of a more open and porous character, and this will eventually produce wood more liable to suffer on exposure to the weather. It is a well-ascertained fact that slowness of growth is necessary to the production of close-textured oak, and if the natural growth of an oak tree is accelerated by culture or otherwise, the timber will be injured in quality in direct proportion to this acceleration. It was reckoned by experts more than 150 years ago that oak peeled of its bark standing, and left so for two or three years, had its sapwood hardened like heartwood; but this hardening in no way added to the durability of the sapwood when it was subsequently exposed to the weather unprotected by paint. It was found that casks made of English oak lasted twice as long as those made from Norway oak, when it was largely imported, for the latter was so porous that "if you put a splinter at the end of a stave a foot or more long, and blow at the contrary end, it will sputter like a piece of cane, if the grain runs straight and there is no knot between." English oak is too close in the grain and too dense to allow water to pass through it in this way. The structure of coniferous wood, that of all the pines, for instance, is simple and regular, being made

up of small fibres or tracheids, which have walls marked with "bordered pits"—pores, in fact, which are covered by thin membranes which serve as passages for water between the adjoining cells or tracheids. In all the coniferous woods the pith rays (medullary rays) and resin ducts are insignificant, and the general texture of the wood is fairly uniform; in the oak, however, though the same arrangement of heartwood, sapwood, and bark, the two former showing well-defined annual rings, is found, the minute structure of the two woods is very different. The wood of oak is what botanists know as being "ring porous"; the wood of all Conifers is "non-porous," and that of the walnut, beech, maple, poplar, birch, and some elms "diffuse porous." In the first there are numerous pores visible in a cross-section of the wood without a magnifier—in fact a thin section looks like a fine sieve; in the second no pores are seen in a cross-section even under the microscope, whilst in the last there are numerous pores, seen with a magnifier, scattered through the annual rings without classification as to size, as in the "ring porous" woods, where there is a distinct stratum of large pores collected together in the spring wood. The pores of the oak and chestnut are the hollow spaces of vessels which have been cut across at right angles in making transverse section of the wood; there are no such vessels in pines and firs. When oak is cut tangentially (basted) the grain seen is produced mainly by the alternation of the pores of spring and summer wood in each ring; whilst in the pines the corresponding tangential "grain" is produced by bands of the darker and lighter, summer and spring, woods of each ring. The medullary rays of oak appear large and conspicuous in transverse and radial sections, but there are several smaller rays of the same kind which can only be seen when magnified; these rays form about one-sixth to one-fourth of the whole wood. The medullary rays in the chestnut (*Castanea*) are much smaller than in the oak; indeed, in some varieties they are hardly visible. This wood is frequently mistaken for oak, and it was formerly split into laths and worked up into the framing of barns and roofs, where it proved quite as durable as oak. Some old authorities assert that for building fences or paling it is preferable to oak. An old writer says of the chestnut, that its sapwood is "whiter, the heartwood browner, and the grain broader than in the oak, by which three signs it is known from the wood of that tree. The reader of these articles is not likely to confuse this chestnut with *Asculus*, or horse-chestnut (known in America as "Buckeye"), for they are in wood and foliage two very different trees, so unlike indeed are they that Linnaeus placed the *Castanea* in the same genus with the beech. Later botanists have, however, restored its ancient name, which is taken from a town in Thessaly, about which it grew in great abundance. The *Castanea* is usually known as Spanish chestnut here, either because it came from Spain originally, or because the well-known nuts are brought from thence. Some say the tree is indigenous, and Evelyn was of this opinion, for he says he had a large barn near London, entirely built of this timber "which grew not far off." In the reign of Henry II. (1154-1189) which, marked the close of building in what is known as the "Norman style, for William of Sens laid the foundation of "Early English" at Canterbury in 1175, a forest of "noble and large" chestnuts grew near London on the north side; and in the same reign a tithe of all "his chestnuts" in the Forest of Dean was given by the King to Flexley Abbey. Miller says chestnut was formerly in greater plenty in England than of late years, "as may be proved by the old buildings, which, were for the most part of this timber; and there are decayed old chestnuts in the woods and chases about London, particularly Enfield Chase." Another writer, Martyn, denies that chestnut was so extensively used in building, and suggests that the supposed chestnut was, after all, oak "of inferior quality." The most remarkable tree of this kind in England was one which grew at Tortworth, in Gloucestershire, in 1150; it was known as the "Old Chestnut of Tortworth." In 1720 it was measured about 16 ft. in diameter at 6 ft. from the ground, and in 1820 it was supposed to be quite one thousand years old!

The Tortworth chestnut was, however, supposed to have been a fraud, for it may originally have been several trees, and one authority asserted the trunk was actually made up of two trees joined together! Another famous chestnut

was the Castagno de Cento Cavali on Mount Etna; in 1770 it measured 20 ft. in circumference; the Castagno del Galea girthed 76 ft. at 2 ft. from the ground, and there was another of nearly the same size known as the Castagno del Nava. The great size of these was due to the soil—a rich volcanic ash. Whether oak or chestnut was used in framing the roof of Westminster Hall is a question the attempted solution of which has afforded much innocent amusement to some persons, authorities on the subject; but a decision in this matter which is likely to be accepted by all parties as satisfactory is as far off as ever. The writer suggests a compromise—viz., that one-half the timber is oak, the other half chestnut, and the whole good, durable stuff, fully up to the specification.

Dealers in home-grown timber profess to be able to distinguish an oak tree which is shaken when it is in vigorous growth, for in such case a rib or longitudinal ridge will be seen along the trunk, or a crack on some part of it. Experienced men say that oaks from a clay subsoil without drainage are nearly always shaken, whilst those standing on dry ground are generally sound. The reason for this appears to be that, as clay holds water, the roots, which are in it, take up more than can be discharged by the leaves, and this superfluous sap makes its way out of a crack or cracks forcibly made in the trunk. When the sap has been discharged for a sufficiently long period it forms a rib, and by this such defective trees may be discovered. Hollow trees have generally a solid ring of sound wood left, so that one may be more valuable for building scantling than another which has a solid but shaken trunk. As seasoned English oak is sometimes wanted and is not always easily obtained, the following experiences of old workmen in this wood may be of use. A cooper had a quantity of green oak which he had just cleft into staves, and, having a large churn to make in haste, he was advised by a lath-render to boil the green wood in his hoop copper. This he did, and they turned the water black as ink. He now dried the staves for a few weeks and worked them into the churn, and "they never swelled or budged," but remained as they were worked, "for when staves are boiled they will become very pliant, and twist almost like soft leather." In the dockyards planks were bent in hot sand; but as this sticks to the wood and injures the workmen's tools, it is not a desirable way to bend wood. Another cooper soaked his staves in a large cask of water for four days, changing the water once, and then dried them in the air; this process answered as well as if the wood had been a year seasoning. Green staves boiled for an hour in two waters can be worked at the end of a fortnight if they are dried in an oven; or in summer by the sun. The sapwood of oak boiled and dried in this way was found to be quite sound after fifty years' use. Oak sap laths were bound in bundles and set out in the weather for a year; treated in this way they lasted more than 100 years, but if they are used without seasoning rot will set in at once, and the wood will be destroyed. Master joiners in "the good old times" had a maxim which is still acted on—viz., that "the strength of the work is the decay of trade," so they sometimes painted green oak, with the result that even where it was heartwood it decayed in a few years. Oak posts charred at the ends in the ground will not last as long as posts not charred, for the fire shrinks the wood all round along the medullary rays, where the fire does not "char" the fibre, and water soaking into the cracks soon destroys the posts. All old writers on the use of English oak, who consulted coopers, lath-renders, and carpenters are unanimous in recommending that oak cut to the scantlings required should be soaked in running water for two weeks, and then dried. The effect of this would be to remove the soluble matter in the sapwood, and thus make it more durable.

Returning to the foreign hardwoods imported for building or furniture, Padouk is the next in alphabetical order. It is a deciduous tree known to botanists as *Pterocarpus dalbergioides*. The heartwood is bright red, streaked brown and black; the sapwood a greyish colour and very narrow. The pores of the wood are filled with resin. It changes colour when exposed to the light, and the rich reddish-brown tinge becomes a clayey-looking brown something like teak. The staircase hand-rail and dado at 45, Fenchurch-street are of Padouk. The tree is a native of the Andaman Islands. It furnishes a good furniture wood,

and is used for parquet floorings. The grain is open and rather coarse, with strong figure. It is much used in the United States for Pulman cars. Here it generally sells for about 1s. 8d. to 1s. 9d. per cube foot. A consignment of *Pterocarpus indicus* and *P. macrocarpus*, both inferior yellowish woods, was once sent to London for Padouk; this brought Padouk into disrepute, and prices went down, as the wood was entirely neglected; but the real Andaman wood is now only sent here. Logs up to 40ft. by 3ft. by 3ft. may be obtained; it shrinks little, and does not crack or split in seasoning. Rosewood, Indian (*Dalbergia latifolia*), is a deciduous tree found growing in the whole of the Indian Peninsula, and northward to the Sikkim Himalayas and Forests of Oudh. It is nowhere abundant, and seldom forms more than from 2 per cent. to 3 per cent. of any forest. Some trees show about eight annual rings to an inch; but it takes about 100 years to grow a tree 22in. in diameter. The heartwood is hard, close-grained, dark purple, streaked longitudinally with black, and the sapwood yellow, forming rather a narrow ring. Rosewood is called "Bombay blackwood" in India. When dry, it weighs 50lb. to the cube foot, and sells in London from £10 per ton, or 4s. per cube foot, up to high fancy prices depending on the figure and condition of the wood. The African or Seychelles rosewood, *Thespesia populnea*, is a small tree or shrub widely distributed in Africa, the Pacific Islands, and Tropical Asia. The heartwood is hard, and of a dark brown colour. It is used in India for furniture, gunstocks, &c. SANDALWOOD (*Santalum album*), is a small evergreen tree, the heartwood of which is a yellowish brown, strongly scented, the sapwood being white and scentless. It grows in the dry regions of Southern India, where old trees show, on an average, over nine rings to an inch; at ten years a tree will be about 8in. in diameter, and at forty years it will have attained a diameter of about 32in., breast high. The wood is heavy, weighing 60lb. to the cube foot, and only one half the diameter of the tree is heartwood. The chief sales take place at Bombay, and the Chinese are probably the best customers for it, as they use the wood for coffins. The yearly sales are given as—Mysore 1841 tons, Coorg 102 tons, Madras 75 tons, total 2,000 tons. There is a red sandalwood, *Adenanthera pavonia*, found in Bengal, Southern India, Burma, and the Andaman Islands. It is a deciduous tree, and the wood, which is red, hard, and close-grained, is much used for building and cabinetwork. A West Australian sandalwood, *Fusanus spicatus*, which has a fragrant heartwood, is sent in large quantities to China. SATINWOOD, *Chloroxylon Siccitania*, is a moderate-sized deciduous tree which grows in Central and Southern India and Ceylon. The wood is hard, yellow, cream-coloured, with a fine satiny lustre showing medullary rays as brilliant shining plates on radial sections. Logs sometimes girth from 8ft. to 9ft.; 6ft. is considered to be the best exportable size; but even these would probably be hollow if grown in India. The wood is heavy, weighing about 64lb. to the cube foot. Ordinary logs are worth about 4s. per cubic foot in Colombo; figury wood runs up to 15s. and over. The rate of growth in girth is as follows:—At 20 years, 18in.; 45 years, 36in.; 75 years, 54in.; and 125 years, 72in. Satinwood from the Bahamas, *Anthoxylum Caribbeum*, is brought into England in considerable quantity. Some of this wood is highly figured, very heavy, weighing 56lb. to the foot, extremely hard, not strong, brittle, fine-grained, compact, and satiny. The colour generally is light orange, with lighter-coloured sapwood. The tree itself seldom grows more than 30ft. high, even under favourable circumstances, the diameter at this height being not more than 18in. Porto Rico and Saint Domingo satinwood sell here for about 83d. per super. foot, lin. thick. New South Wales Satinwood, *Daphnandra nivalantha*, is a much larger tree than the semi-tropical variety last described, for it grows to a height of 80ft., with a diameter of 27in. The wood, which is yellow, is not put to any particular use at present. East Indian Satinwood is sold here by the superficial foot, measured by Hoppus's quarter girth, and the contents reduced, allowance being made for split or faults; logs are sold as plain or figured, there being usually about 360ft. superficial in a log. SATIN WALNUT, *Liquidambar styraciflua* (syn. *L. macrophylla*)—common names, Red Gum, Sweet Gum, Alligator wood, Bilsted, and Star-leaved Gum, a tree about 100ft. high and

from 4ft. to 5ft. in diameter. It is found growing in the United States from Connecticut to South-east Missouri and Arkansas, and towards the south from Florida to Texas; it attains its greatest development in the low, wet soils of the bottom lands in the Missouri basin. Satin walnut is hard but not strong; it is a close-grained compact wood of a bright brown colour tinged with red, and though it takes a good polish, it shrinks and warps badly in seasoning. It is used as a substitute for black walnut in cabinetwork. A good deal is also used in ordinary lumber, boarding clapboards, and street pavements. It sells here in boards $\frac{3}{4}$ in. to 1 $\frac{1}{4}$ in. thick at 1 $\frac{1}{2}$ d., $\frac{3}{4}$ in. at 1 $\frac{1}{4}$ d., and $\frac{3}{8}$ in. at $\frac{1}{2}$ d. A cube foot weighs 37lb. SNAKEWOOD, *Strychnos nux-vomica*, is a tree found growing in the deciduous forests of India, Central Provinces, Burmah, and Ceylon. The wood is used for fancy cabinet work in account of the fantastic pattern which is seen on cross section. The tree shows no annual rings, and it has no heartwood. It is difficult to work, for although it is close-grained, it is very liable to split, twist and warp. A cube foot weighs about 50lb. British Guiana Snakewood or Letterwood, *Brosimum Aubletii*, is used for inlaying. TEAK, is, for outside work, the most valuable wood known to builders, as it shrinks less, twists less, and is more durable than any other. For all good work the architect should use teak, and teak only, especially in sashes, casements, sills, and other moving and fixed parts of carpentry and joinery where great strength is required. Teak is the wood of a tree known to botanists as *Tectona grandis*; it is of the tribe *Vitaceae*, and the order *Verbenaceae*. It is deciduous, and is found growing in deciduous forests, its chief companion in Burmah being the bamboo, to which it forms a kind of "clear story" by overtopping it. The chief districts in India furnishing teak are Chanda, North Kanara, Wynad, the Anamalai Hills, and Travancore. In Burmah teak is common in the mixed forests of the Arracan Yoma, the Pego Yoma, and the Martaban Hills, the northern limit being about 25° 30' north latitude, where it is found of stunted growth only. Teak is also found in Siam, Cambodia, Cochin China, and the Dutch Indies, Java having at present a considerable area under teak plantation, which will soon become very valuable. Teak would not grow in England, as it requires a mean temperature during the cold season of between 60° and 80°, during the hot season between 80° and 85°, and a mean annual temperature between 72° and 81°. It grows best in a well-drained soil, where it is well lighted and has a free circulation of air all round. The wood is moderately hard, gritty in working. If a splinter enters the finger it will poison it, and give rise to a painful inflammation which will last for days. This is probably due to the oil with which the wood is impregnated. When first cut, the heartwood of teak is a dark golden yellow; but it gradually turns the peculiar brown colour so well known in teak logs and flitches; finally it becomes almost black with age. Teak is not usually felled green; it is girdled as it grows, standing, in order to kill it. When freely exposed to the air and sun after girdling, the wood seasons in a year or two if the trees are of moderate size; the smallest girdled are about 23in., larger trees require a much longer time. Like trees in our climate, teak makes one ring annually, the period of rest with it being the dry season, which corresponds to our winter. The width of the annual rings or rate of growth will vary with soil, climate, altitude, &c. In Malabar, where the climate is moist and equable, 2 $\frac{1}{2}$ rings go to make up an inch of radius; in Koloon the growth is sometimes so slow that 9 $\frac{1}{2}$ rings make up an inch; in a good climate and suitable soil, four rings to an inch would be reasonable, which gives a 6ft. tree at 46 years, and one 8ft. at 61 years. It takes ten years for a teak tree to establish itself, as seedlings apparently burn back before they send up a shoot that at last grows into a tree. Teak logs are always heart-shaken, and in conversion for building purposes the heart must be cut out where the shake extends from the centre each way in nearly a straight line. The waste is not great if the shake does not twist as it goes through the trunk; but it is disappointing to find the same shake horizontal at one end of a log and vertical at the other end, for then the waste in conversion must be great. All teak wood above 20in. diameter is heart-shaken from end to end, so that the builder buys to the best advantage when he secures wood already converted into

flitches or planks. Malabar teak, grown on the western side of the Ghat mountains, though brittle, seems the best for building; that from Rangoon is lighter, and more open in the grain. It is asserted by some authorities that girdling teak makes it brittle, and deprives it of its oil; hence the process has been discontinued in some places. But, in any case, full-grown timber must be killed at least two years before it is cut down. Teak wood varies as much in texture as oak does when grown in England, America, and Germany; it also varies much in weight, being from 39lb. to 53lb. to the cube foot when seasoned; when green it weighs about 57lb. 9oz. In our issue of the 4th inst., on page 301 of the present volume of the BUILDING NEWS, the ends of Rangoon teak logs are sketched showing the heart shake described above. The logs illustrated are 26in. square. The heart of the tree is usually much out of the centre of the log, so that here the sketches of the rings are only diagrammatic. The average rate of growth in Burmah is 3ft. girth in 68 years, $\frac{1}{2}$ ft. in 97 years, 6ft. in 133 years, and 7ft. in 159 years; but the actual rate of growth varies very much according to circumstances, for a 7ft. tree will sometimes represent the growth of only 100 years, whilst another of the same size will be 200 years old. In general forests teak trees do not make more than 1 in 500 of the other trees; in fact, in what are known as teak forests the proportion is only 1 to 300. The leaf of the teak is 16in. across, and something like a cabbage leaf, but very thin, with strong fibre. A tree reaches maturity at about 160 years. First class sawn teak logs are worth, wholesale, here from £11 to £15 per load, and sawn flitches may be included within the same range of prices. The latter, with the teak planks 4in. and 10in. by 19in. and 21in., running up to the highest figure. Six shillings a cube foot is a fair wholesale price for teak in scantlings, not allowing for profit or waste. Eight shillings a cube foot should pay for the best teak in sashes and frames, material only. Shipments of teak are made from Rangoon, Moulmein, and Samarang (East Indies). Teak shingle roofing is common in Burmah. The shingles are cut to 15in. by 5in., $\frac{1}{2}$ in. thick at one end, tapering to nothing at the other end. They are cut with a circular saw, and fastened to lin. by 2in. battens with French wire nails. They are laid to weather 5in. AFRICAN TEAK (*Oldellia Africana*), also called African Oak, comes here from Sierra Leone. AMERICAN WALNUT (*Juglans nigra*), Black Walnut, is found growing from New England to Texas, and from Michigan to Florida. The wood is heavy, hard, strong, coarse-grained, and liable to split if not carefully dried. It is easily worked, and takes a good polish; the heart is a rich dark brown colour with lighter sapwood; a cube foot dry weighs 39lb. The figure of walnut is not usually ornamental; a tangent-cut face shows more "grain" than one cut radially; the wood is in great demand for cabinetmaking. American walnut sells in the log at from 16d. to 18d. per cube foot, average prices; 28ft. cube is a common content for logs. Planks from 6ft. to 15ft. long, and $\frac{1}{4}$ in. to 2in. thick, are worth 3s. 9d. per cube foot, and boards 1in. thick 2d. to 2 $\frac{1}{2}$ d.; $\frac{3}{4}$ in., 2 $\frac{1}{2}$ d.; $\frac{5}{8}$ in., 1d. Lagos walnut sells for 3 $\frac{1}{2}$ d. per foot in the inch, and Italian walnut in planks for 60s. per ton. Other varieties of walnut are *Juglans cinerea*, commonly called "Butternut"; *J. rupestris*, Mexican; and *J. Californica*, California. The American black walnut is a tree growing to 100ft. or 150ft. high, with a diameter of 6ft. to 9ft. English walnut was formerly much used for cabinetmaking and gunstocks; the sapwood and roots were also used. Hence the trees were seldom cut down, but almost always "grubbed" up. In 1745, 3s. per cube foot was paid for the English green walnut; many trees at sixty years old, an age at which they reached perfection, being sold to cabinet-makers for as much as £60. These old cabinet-makers polished their work with oil extracted from the nuts, three quarts of which they obtained from a bushel of nuts. It is thought that walnut really means Welsh nut, and that there are several varieties in this country. Nuts for seed were brought over from Virginia, the trees from this seed were "black" walnuts, and they yielded good timber; next came trees grown from seeds obtained at Grenoble; the wood from these was also much prized by cabinet-makers 150 years ago. An old writer says of walnut: "Some wood, especially such as has come from Boologne and New England, is very black of

colour, and so admirably streaked as to represent natural Flowers, Landscips, and other Fancies. To render this the better coloured, the joiners put the boards into an oven after a batch of bread is forth, or lay them in a warm stable, and when they work it, polish it over with oil very hot; which makes it look black and sleek." The writer goes on to say: "It is not good for beams or joists because of its brittleness, though it has been observed to give timely notice of the cracking before it breaks." WHITE WOOD, *Liriodendron tulipifera*, called also yellow poplar from the heart-wood, and white poplar from the sapwood; but it is not a poplar, so that these names are wrongly applied. This is a large tree, which grows from 80 to 180ft. high, and from 3ft. 6in. to 10ft. in diam.; but it is common in the Ohio basin, United States; it is also found from New England to Missouri, and southward to Florida. The wood is light, soft, stiff, and fairly strong, of fine texture and yellowish colour, it shrinks considerably in seasoning, but does not split much; works easily and stands well—an ideal wood for the carver. The best section for "figure" is tangential, but a radial face gives best finished surface for ornamental work, as the medullary rays show up crossing the vertical grain in horizontal bars of silvery wood, there being as many as 25 and 30 to the inch. The wood of the cucumber tree (*Magnolia acuminata*) looks so like whitewood that it is often taken for it in the trade. Whitewood is frequently put on the market here clear of "saps" and planed. Planks are sold for 3s. per cube foot, boards 1in. thick, 1d. per superficial foot. 2in., 1½d.; 3in., 2d.; 4in., 1½d. Whitewood is used for doors, paneling, and wainscoting. The next and final article in this series will be one on the measurement of timber.

INTERNATIONAL FIRE EXHIBITION, EARL'S COURT.

THE General Exhibition Awards at the above exhibition have been made. Among the names likely to interest our readers we note the following:—

COMMERCIAL EXHIBITS.

British Uralite Co., Ltd., Group 1, Class 1, Silver Medal.
Columbian Fireproofing Co., Ltd., Group 1, Class 1, Gold Medal.
Columbian Fireproofing Co., Special for Fire-resisting Roofs, Gold Medal.
Drew-Bear, Perks and Co., Ltd., Group 12, Gold Medal.
J. H. Heathman and Co., Group 12, Silver Medal.
Homan and Rodgers, Group 1, Class 1, Silver Medal.
J. A. King and Co., Group 1, Class 1, Silver Medal.
The New Expanded Metal Co., Ltd., Special for Metal Lathing, Gold Medal.
Ratner Safe Co., Group 1, Class 2, Gold Medal.
St. Pancras Ironworks Co., Ltd., Group 1, Class 2, Gold Medal.
John Smith and Co., Group 2, Class 2, Bronze Medal.
Stuart's Granolithic Stone Co., Group 1, Class 1, Silver Medal.

FIRE-RESISTING ROOFS.

Columbian Fireproofing Co., Ltd., Gold Medal.

METAL LATHING.

The New Expanded Metal Co., Ltd., Gold Medal.

FIRE PREVENTION: CLASS 1.—BUILDING CONSTRUCTION.

British Uralite Co., Ltd., Silver Medal.
Columbian Fireproofing Co., Ltd., Gold Medal.
Homan and Rodgers, Silver Medal.
J. A. King and Co., Silver Medal.
Stuart's Granolithic Stone Co., Silver Medal.
Jabez Thompson, Bronze Medal.

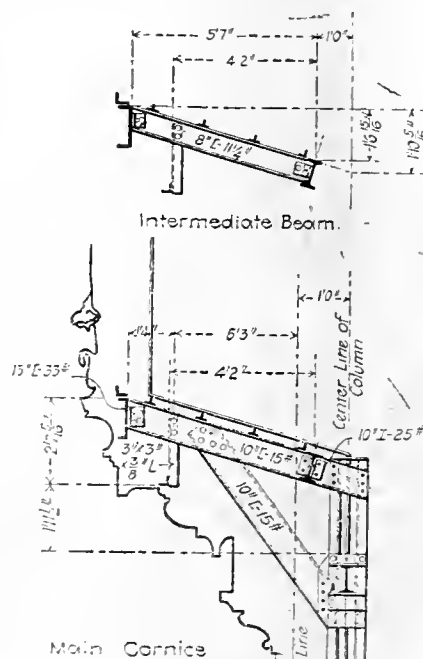
CLASS II.—BUILDING EQUIPMENT.

Ratner Safe Co., Gold Medal.
St. Pancras Ironworks Co., Gold Medal.

A WIDE STEEL-FRAME CORNICE.

THE sixteen-story Bank of the Metropolis is a steel cage office building, which occupies a prominent corner on Union-square, New York. The street fronts are conspicuous, and their upper portions are finished with a very heavily-moulded copper cornice, which projects about 6ft. beyond the centres of the wall columns. This cornice is suspended from beams, channels, and angles parallel to the wall, and supported beyond its face by cantilever brackets riveted to the columns, as indicated in the diagram of the corner of the roof framing. On the Sixteenth-street front the brackets are double, each portion consisting of a pair of inclined channels, shop-riveted together, back to back, and having their lower ends field-riveted across the flanges of the wall columns, and to its projecting tie-plates. Rigid arms are thus provided, which are connected at the outer ends by a 15in. channel, forming a fascia girder to support the extremities of inter-

mediate transverse members parallel to the cantilever brackets. These are single 8in. channels, spaced about 5ft. apart and riveted at the inner ends to the webs of a line of I-beams, parallel to and just beyond the wall columns. These I-beams have their flanges inclined parallel to the roof surface, and are web-connected to the cantilever brackets. The upper edges of the beams and brackets are inclined parallel with the surface of the roof, which slopes inward so as to form a gutter on the centre line of the columns to prevent drip and the formation of icicles, and to diminish the danger from snow falling from the roof to the street. The cross beams carry longitudinal T-bars spaced 19in. apart to receive the flat roof tiles, and the parapet wall is built over the centre of



the fascia girder. At the corner of the building single cantilever brackets are riveted to each of the two inner faces of the column, and the square portion of the cornice between them is carried in the centre by a diagonal bracket, similar to the regular ones but longer, which is attached to the outer flange of the column.

The cornice on the other street front is similar to the one described, except that it is narrower, and the cantilever brackets are made with single instead of double channels. By this construction the cornice is made strong and rigid, and is entirely independent of the roof framing, which is supported at the edges on lines of 15in. I-beams riveted to the faces of the columns below the bracket connections.

Mr. Bruce Price was the architect of the building, and the details of the steelwork were designed by Messrs. Purdy and Henderson, consulting engineers. The structural steel was fabricated by the Carnegie Steel Company, and was erected by the construction department of the United States Realty and Construction Company, which was the general contractor.—*The Engineering Record*.

The unveiling of the memorial statue of Lord Russell of Kilowen took place at Newry on Wednesday week.

The Budleigh Salterton U.D.C. have retained Messrs. Beesley, Son, and Nichols to prepare a scheme for the improvement of the water supply of the district.

At a number of Burnley places of worship structural alterations and improvements have been in progress for some time. The parish church scheme will take about six months to complete, and will entail a cost of about £4,000. It consists of the erection of a new clergy vestry, the removal of one of the three galleries, the installation of the electric light, the erection of a memorial to the late rector, and other works. At Ebenezer Baptist Chapel, a scheme for the building of a new organ and the redecoration of the premises has just been completed at an expenditure of about £1,300. The chapel was reopened last week.

PROFESSIONAL AND TRADE SOCIETIES.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—The opening lecture of the senior architecture class in this college was delivered on Monday evening by Professor Gourlay, the subject being "The Christian Churches of Athens." The lecturer began by referring to the way in which the Parthenon and other temples were altered to serve as Christian churches. He divided the churches erected by the Christians in the Byzantine style into three distinct types—(1) Those possessing a large central dome, as may be seen in the Church of St. Nicodemus; (2) those having a small dome at the "crossing" of the four arms of the Greek cross, as in the Old Cathedral or Metropolis; and (3) those with the basilican or western type of plan, as in St. Mary's of the Great Monastery. The names of the various parts of a Greek church, with the uses to which they were put, were explained. Finally the methods of building used in the churches of Athens, with the architectural results obtained, were studied. The lecture was illustrated by means of photos, collected, and by sketches drawn by the lecturer while on a recent visit to Athens.

HOUSE PAINTERS' AND DECORATORS' ASSOCIATION.—The tenth annual convention of the National Association of Master House Painters and Decorators of England and Wales was opened at Nottingham on Tuesday. It was attended by a large number of delegates and others, including the Mayor of Nottingham (Councillor A. W. Black), Lord Henry Bentinck, M.P., and the presidents of the Irish and Scottish associations. In connection with the gathering an exhibition of decorative art as applied to manufactures was also held. The mayor, in the name of the city, welcomed the association to Nottingham, and Lord H. Bentinck, in appropriate terms, formally declared the exhibition open. The president of the association (Mr. John Riley, of Nottingham), in his inaugural address, congratulated the association upon its increasing prosperity. He denied that they were united to combat labour, for they were actuated by much higher motives. They wished so to educate their lads that they might cope successfully with any form of decorative treatment required. The necessary instruction was not provided in the ordinary technical schools, but they had taken matters in hand themselves and established technical classes in nearly every town where there was a local association. They had almost completed a scheme for the establishment of a national training school in which their lads could be educated instead of having to study on the Continent. The reading of papers followed. At the conference on Wednesday it was decided to persevere with a scheme for the establishment of a school of painting, the suggested headquarters being Manchester. It was reported that liberal financial support had been promised to the project, which was not designed in any spirit of opposition to the South Kensington or other classes. The president-elect of the association is Councillor J. Higson, of Manchester, and next year's convention will accordingly be held in that city.

The nave walls and sanctuary roof of the parish church of Allington, Kent, are being decorated in colour. The artist is Mr. Godfrey Gray.

The interior of St. Simon and St. Jude's Church, Anfield, Liverpool, has been improved by the installation of electric light, and by painting and decoration. The former work has been carried out by Messrs. T. Jones and Co., of North John-street, Liverpool, and the latter by Messrs. Jelley and Co., decorators, of Slater-street, Liverpool.

Messrs. Chancellor and Son, contractors, of Bath, have completed a new iron bridge over the Yeo at Congresbury. An old stone bridge replaced by the new structure was only 19ft. wide; the new means of communication has a width of 28ft., or 9ft. more. Its rise is also 2ft. less, and a footpath 4ft. wide is provided for pedestrians.

The city council of Lichfield have decided to re-sewer the central portions of the city in accordance with plans prepared by Mr. Elliott, C.E., at an estimated cost of £7,000.

The new graving dock, which will constitute an all-important addition to the shipbuilding resources of Belfast, is now about to be constructed at the harbour. At the last meeting of the Harbour Board, the tender of Messrs. Middleton, Scott, and Co., of London, for the construction of the dock was accepted. The amount of the tender is £206,000. The work is to be completed in three years, but if it is finished in three months less than the three years the contractors will receive a bonus of £600.

Building Intelligence.

ABERDEEN.—The church erected for the parish of Greyfriars, in place of the pre-Reformation edifice which has been removed to make room for the extension of Marischal College buildings, has been formally opened by the Rev. Dr. Gillespie, Moderator of the Church of Scotland. The new church forms the southern boundary of the general plan for the extension of Marischal College, and in its architectural features follows the striking design of these buildings, its tall and massive tower forming the main feature. Internally, the edifice is divided into nave, aisle, and chancel, and has a gallery in the west end under the tower. The fourteenth-century window, which was transferred from the former church, has been built into the east wall. It has been filled with stained-glass work. The figures represent Old and New Testament characters, and illustrate the general and local history of the church, and several compartments in the tracery are filled with symbols of the Passion. In the south aisle there is a row of six stained-glass windows. Between £2,000 and £3,000 has been spent by those connected with the congregation in beautifying the church. The building is seated for 800 persons, and is lighted by electricity throughout. Including the site, the church has cost the Town Council about £25,000. Mr. A. Marshall Mackenzie, A.R.S.A., Union-street, Aberdeen, is the architect.

BASINGSTOKE.—The Bishop of Portsmouth on Tuesday opened the new Roman Catholic Church of the Holy Ghost, in Basingstoke, which has been designed, built, and adorned entirely at his own cost by the Very Rev. A. J. C. Scoles, rector of the Roman Catholic Mission at Basingstoke, in celebration of his silver jubilee as a priest. The site of the church adjoins the ruins of the famous Chapel of the Holy Ghost, which was demolished by Cromwell's army in the days of the Commonwealth at the time of the siege of Basing House. The new church is in the Early English style, and the interior is magnificently decorated. The altar is of onyx, the pillars of marble, and the tabernacle of pure gold.

CLERKENWELL.—The new hall of the Knights of St. John, just erected on the east side of St. John's-lane, Clerkenwell, has been completed. The extension of the premises has been carried out so as to preserve the appearance of continuity with Prior Docwra's gateway—all that remains of the once famous headquarters of the English Langue of the Order of St. John of Jerusalem. The ground floor is used as a showroom for ambulances and transport waggon; above this are the brigade offices; and on the top floor is the hall, a lofty and well-proportioned apartment, panelled in oak with a massive oak roof, the groining of which corresponds in character with that of the archway of St. John's Gate. The wall-pieces of the roof are supported on stone corbels carved into figures of angels holding shields. There is a rectangular lantern, and in the windows are inserted a number of coats of arms, copied from the escutcheons of knights carved upon one of the towers of the Castle of Badrum, in Asia Minor, which was built by the Knights Hospitallers in the 15th century, and surrendered to the Turks in 1522. The opening of the lantern is divided into two squares by a massive crossbeam, and on each side of these squares are four shields—in all thirty-two—on which it is intended to blazon the coats of famous knights. On the east side of the hall, on a dais, are three chairs of state in carved oak. At the south end is a stone fireplace, with mantel, on which are three shields of arms. Two mounted suites of armour flank the fireplace, and on the walls are a number of paintings of notable members of the Order in the 16th-century. The chamber on the ground floor of the east tower contains the library, and also serves as a reception-room. In this room may be seen the only known fragment of the original priory—a few square feet of herring-bone masonry—for the conventual buildings erected in the 12th century were burned during Wat Tyler's insurrection in 1381.

CROSRAGUEL ABBEY.—Following upon the principal works, which were several years ago carried out for the preservation of the ruins of Crosraguel Abbey, situated midway between Maybole and Kirkcaldy, a number of further minor works, with the same object in view, and which have been going on for some time, have now been completed. These additional works, as also the

principal portion, have been carried out by Messrs. Milligan, builders, Ayr, under the direction of Mr. J. A. Morris, architect, F.S.A. Scot., Ayr. The abbots' tower at the south-east corner of the abbey, through which runs the small rivulet giving the water power for the driving of the abbey mill, is in a very dilapidated condition, particularly the western wall. Recent excavations at the west end of the nave outside have revealed a fine Gothic arch, filled in with masonry, in which there is a rectangular niche. This arch was a doorway, but why it had been filled up cannot be conjectured.

DRESDEN, STAITS.—The reopening of the Church of the Resurrection, Dresden, near Longton, North Staffordshire, after enlargement of the chancel and renovation of the church, with dedication by the Bishop of Lichfield of the addition to the chancel, the memorial windows, and other gifts, took place on Tuesday week. Designs for the present church were made just half a century since by Mr. (afterwards Sir) Gilbert Scott, and the church as it first existed, with provision for future enlargement, was erected by Mr. Evans, builder, of Ellastone. Dresden Church was consecrated by Bishop Lonsdale in 1853, and at once came into use as a chapel-of-ease to Blurton. Ten years after the south aisle was added at a cost of £450. In 1872 the whole fabric westward was lengthened two bays, and 200 additional sittings were thus provided, at a cost of £1,079. In 1879 an organ-chamber was added, and ten years later a new organ was placed therein. In 1881 further improvements were made. Now, after a lapse of 22 years, the jubilee of the consecration has been chosen for carrying out a renovation of the whole interior, a lengthening of the chancel by 10ft. eastward, and an improvement in the lighting of the nave. The alterations in the fabric have been designed by Mr. J. H. Beckett, architect, and carried out by Messrs. Tompkinson and Bettelley, while the painting and decorating have been done by Mr. P. H. Bennion. The memorial windows, all of which are in the chancel, are from the studio of Messrs. Heaton, Butler, and Bayne, London. A new west window has been inserted.

LITTLE ILFORD.—New Congregational church and schools are to be erected at Little Ilford. The buildings are designed in a Late period of Gothic freely treated, and are faced externally with red brick, the dressings and tracery, &c., being of white Costessey work. Minister's and deacons' vestries are provided in connection with church, with other conveniences. The choir and organ are situated in apse behind pulpit. The seating is circular on plan, radiating from the pulpit as a centre, so that every member of the congregation directly faces the preacher. The accommodation of the church is for 724 adults. The school accommodation comprises a main hall on first floor, size 32ft. 6in. by 45ft., together with ladies' retiring room and men's retiring room in connection with same. Also kitchen, cloakroom, and other conveniences are given on this floor. On the ground floor is placed the minor hall, size 35ft. by 32ft. 6in., together with three classrooms, cloakrooms, and other conveniences. Electric light is to be adopted throughout. The contract for the two buildings complete is £4,435. Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C., are the architects; and Messrs. F. Gough and Co., Church-road, Hendon, N.W., are the builders.

MIDHURST.—The contract work of erecting the King's Sanatorium at Midhurst was commenced last week. The pumping operations for water supply have all been completed by Messrs. John Aird and Son, and they are now carrying out about a mile and a half of road for access to the site from the main road. Messrs. Langley, of Crawley (the firm who have completed Christ's Hospital, Horsham), have obtained the contract for the foundations of the main building. Last week on p. 394, by a slip of the pen, we referred to Mr. A. W. West instead of to Mr. H. Percy Adams, F.R.I.B.A., of Woburn-place, as the architect. Mr. A. W. West was the architect who collaborated with Dr. Latham in producing the essay (Mr. West making the plans) that obtained the first premium in the essay competition, which was thrown open to all the medical men in the world, when some one hundred and eighty competed. This essay (and the plans) referred to an imaginary sanatorium for an ideal site, and the plans were for the purposes of illustrating Dr. Latham's ideas. At that time the site for the sanatorium had not been selected.

After the essay competition was over the committee carefully went into the question of the selection of an architect to design the new building, and all the architects associated with the successful essays, and also several other architects who did not compete, were interviewed by the committee, who selected Mr. H. Percy Adams. The designs now being carried out at Midhurst bear little resemblance to any of the successful essay plans, but are on the lines suggested by Dr. Latham.

SUNDERLAND.—The Palace Theatre of Varieties at Sunderland was reopened last week, after having been closed for several months for alterations of an extensive character. The stage, together with the proscenium, has been brought forward 10ft. The proscenium arch is supported at each side by two Corinthian pillars, with embellished pedestals, and consoles at the top of each, and the summit of the arch is panelled and enriched with mouldings, the whole being crowned with a Classic cornice, with medallion incidentals. The four boxes on either side are surmounted above the second circle level with balustrades, above which has been erected domes, to be illuminated with numerous red, white, and blue electric lights. The prevailing tints in the whole of the decorations are vermilion and gold. Additional dressing-rooms have been made, and among other improvements are additional lighting facilities on the stage, electric lighting for the whole building, increased accommodation for the orchestra, and the rescating of the building. A great change has been made in the modes of exit from the pit, pit stalls, second circle and gallery. The alterations were designed by Messrs. W. and T. R. Milburn, Sunderland, and the contractor or building was Mr. T. P. Shafto.

WHITTINGHAM, NORWICH.—The completion of extensive improvements, alterations, and additions at the Norfolk County Lunatic Asylum at Whittingham was celebrated on Thursday in last week. The chief feature of the scheme, which has been carried out from plans by and under the direction of Mr. A. J. Wood, has been additional accommodation for male patients. Three new blocks have been added to the annexe of 1880, situated some 500 yards north of the main asylum. The main building is now devoted to female and the new one to male patients. The new works comprise the enlargement of the annexe, and its conversion into a complete asylum for male patients, retaining the original building for females, and the rearrangement of the stables, artisans' workshops, and boiler-house. The contractors for the building were Messrs. W. King and Son, 3, Vauxhall Bridge-road, Westminster, S.W. The total outlay has been about £170,000.

CHIPS.

The old grammar school on Sparrow-hill, Rochdale, having been demolished, the work of building a new nurses' home on its site has been commenced this week. The home will be of red brick with stone facings. It is expected to be ready for opening early in the spring.

A new district church is to be built at Hordle, near Lymington. Mr. Thomas Pike, of Milford-on-Sea, is the contractor.

The board of guardians for Bury, Lancs, have adopted plans for the building of a new workhouse infirmary at an estimated cost of £35,100.

The Mayoress of Newcastle-on-Tyne opened the new Wesleyan mission-hall in Westgate-road in that city last week. The hall, which will afford seating accommodation for 1,400 people, and is over nine shops, is estimated to cost nearly £30,000, the site being worth £8,700.

At Polperro, Cornwall, foundation-stones were laid last week of a Wesleyan chapel. The building will be Modern Gothic in type, will be faced with stone, and seated and furnished in pitch-pine. Accommodation will be provided for 450 persons, and the architects are Messrs. John Wills and Sons, of Derby and Lincoln.

The Commissioners appointed by the Australian Government to inquire into the construction of a Trans-Australian Railway have sent in their final report, in which they recommend the adoption of the Tarcoola route, at an estimated cost of over four and a half million pounds. The proposed railway is intended to develop the unknown interior of Western Australia.

The Bishop of Nottingham, Dr. Brindle, D.S.O., laid on Monday the foundation-stone of a new Roman Catholic church, to be erected in George-street, Barnsley. The site cost about £1,000, and the building itself, which will accommodate about 700 worshippers, will cost from £8,000 to £10,000.

Engineering Notes.

BIRMINGHAM.—Good progress is being made with the construction of the new viaduct to connect Small Heath with Sparkbrook. The first span, from Bolton-road, has been finished, and the second is now being bolted together on a wooden framework, and will probably be dropped into position on the piers, with the aid of "jacks," during next week. This span, which will finally contain about 370 tons of steel, is the largest of the series. It is 144ft. in length, and the main girders alone weigh 90 tons each. Immediately it has been fixed in its permanent place the fitters will be busy with their cranes and pneumatic riveting apparatus on the third span—the one that will cross the main line. For this section the steelwork has already been bolted together tentatively in the maker's yard at Motherwell. All the piers, eleven in number, were erected on their foundations some time ago, and the brickwork at the two extremes of the bridge has been completed, together with that portion which extends across the canal on the Montgomery-street side of the railway. Here the approach to the bridge has been improved by the demolition of some private property, and the widening of the thoroughfare at the junction of Kendal-road and Montgomery-street. The total cost will reach the estimate of £49,000. The bridge will be ready for traffic next spring.

KIRKCALDY HARBOUR EXTENSION.—Sir A. M. Rendel met a joint committee of Kirkcaldy Town Council and Harbour Commission on Thursday night in last week regarding the proposed harbour extension, and produced plans showing the existing harbour and wet dock converted into one large wet dock and outer harbour, six acres in extent, with detached breakwater 500ft. long, for summer steamers and trade in good weather. The total cost he estimated at £100,000. The engineer was authorised to prepare a written report on the scheme, plans to be distributed amongst the members before next meeting, for discussion in time for obtaining Parliamentary powers.

NEWCASTLE-ON-TYNE.—A visit was recently paid by the Newcastle-on-Tyne Association of Students in connection with the Institution of Civil Engineers to the new high level bridge which is being erected across the Tyne between Newcastle and Gateshead for the North Eastern Railway Company by the Cleveland Bridge and Engineering Co. The bridge is situated between the existing High Level Bridge and Redheugh Bridge, and is to consist of four spans of steel girders supported on piers of granite ashlar with approaches on either side formed of stone arches. It will carry the main railway traffic between north and south. The work is being carried out under the direction of Mr. Chas. A. Harrison, chief engineer to the North Eastern Railway Co. The sinking of the caisson on the Gateshead side is now being carried out. Mr. Harrison explained the plan to the students, mentioning that in the Forth Goods Yard, between the Carlisle line and the other side of the Forth warehouse, the underground work to make the ground carry the additional weight required 5,000,000 bricks to build. From Pottery-lane to the land abutment, the bridge arching is practically completed, and there are ten arches in all. A temporary stage is being prepared round the north caisson for the first pier. The centre pier temporary stage is complete, and the caisson, 113ft. by 35ft., will be sunk 69ft. below high water. The south caisson is sunk 59ft. below high water, and it is filled up with 7,500 tons of concrete; the weight of the caisson itself is about 500 tons. The sinking done is about 10in. per day. Owing to the strata on the Gateshead side, the original plan had to be abandoned, and instead of four arches the foundations are now being made of a pier, which is practically an abutment. Old coal workings, dating from very early times, were come upon here, and the filling in required 700,000 bricks. The contractors are going to erect pillars on either side of the bridge, 120ft. high, to take a cable way across for building the centre pier. This will be 9½in. in circumference, and will carry a load of ten tons. The cable is the output of Messrs. T. W. Smith, Newcastle. The caissons of the new bridge will cover an area of 3,600 square feet.

ROKER, SUNDERLAND.—The conclusion of an important undertaking of the River Wear Commissioners was signalled on Wednesday, when,

to record the completion of the Roker Pier, a large polished block of black granite was placed in position in the lighthouse at the extremity of the pier by the Earl of Durham, Lord-Lieutenant of County Durham. This great scheme, which is being carried out at a cost of over half a million sterling, was inaugurated eighteen years ago. It embraces the construction of two piers of granite and concrete on the north and south sides of the river, which, when completed, will render safe the entrance of vessels in any kind of weather, and also form a harbour of refuge. The immense granite and concrete blocks, weighing up to fifty-six tons, used in the building of the piers have been constructed at works belonging to the Commissioners, where they have been placed upon waggons by a Goliath crane, and then lifted into position at the Roker Pier by means of a sixty-ton hydraulic radial crane. The length of the pier just completed is 2,800ft., and the new pier in course of construction on the south side of the river will be 2,844ft. in length, of which 2,299ft. have been constructed. The width of the Roker Pier is 35ft. for a distance of 2,000ft. out, and for the remainder it is 41ft. The height above high water is 10ft. At the extreme end of the pier a round-head has been constructed on a foundation 40ft. below low water, and rising to a height of 18ft. above the level of high water, the total height of the structure being 72ft. 6in. It rests upon a caisson 101ft. long by 69ft. wide, which, when sunk into position, was filled with 10,000 tons of concrete. The lighthouse erected upon this structure is of red and white granite, and rises to a height of 54ft. 6in., its diameter at the bottom being 31ft., gradually reduced to 16ft. at the summit, and the lantern has a diameter of 10ft. Its focal plane is 33ft. 6in. above high water. The cost of the entire scheme is expected to be about £549,000, of which the new pier just completed will cost £290,000, including the round-head and lighthouse. The works have been carried out from plans by and under the supervision of Mr. H. Hay Wake, M.Inst.C.E., who since 1878 has been the engineer to the Wear Commissioners.

There has just been erected in St. Giles' Cathedral, Edinburgh, a memorial to the late Mr. Lindsay Mackersy, W.S., clerk of the church and parish. The memorial, which has been placed in the vestibule of the north door, is in the form of a bronze tablet, which in its brief inscription conveys a sense of the very great services Mr. Mackersy rendered to St. Giles' during his lifetime. The tablet was designed by Messrs. Hamilton and Inches, of Edinburgh.

At Cleator Moor, in West Cumberland, on Friday, the unveiling took place of a public memorial to commemorate the golden wedding of Mr. and Mrs. John Stirling, of Fairburn, Muir of Ord, Ross-shire, and the proprietor of the well-known Iron Ore Mines, Cleator Moor. The memorial takes the form of a monument erected in the Market Square. It is of Balmoral granite, alternated with dark grey Rubislaw granite, and consists of a fountain, surmounted by a stork, with a bill erect forming the water-jet. The whole is elevated upon a three-stepped granite basement, 10ft. 6in. square. The urban district council are enclosing the monument with an iron fence and granite kerb.

The town-hall at Wolverhampton, built in 1871 at a cost of £20,000, is being enlarged, at a cost of about £15,800, from plans by Mr. F. T. Beck, architect, of Wolverhampton.

Two memorial windows have just been placed in Holy Trinity Church, Malvern. One is emblematic of Purity and Charity, and the other has as a subject Christ blessing little children.

Subject to Parliamentary powers being obtained next session, a light railway is about to be constructed from the railway terminus at West Kirby across the Dee to Rhyl, Colwyn Bay, and Llandudno to the North Wales coast, reducing the distance from Liverpool in point of time by more than one-half. The project will involve the construction of a span bridge over the Dee between five and six miles in length, and it is intended to carry it straight across from the Cheshire side over the Tansky Rocks or Little Eye, joining Flintshire between Mostyn and the Point of Air, probably at the South Sluice. The railway will then proceed along the side of the road through Rhyl and Colwyn to Llandudno. The engineering side of the undertaking has been allocated to Mr. C. H. Davison, of London, and the surveyors are Messrs. Boulton, Son, and Maples, of Liverpool.

At St. John's Church, Woolwich, a memorial organ, built by Messrs. W. Hill and Son, was dedicated on Thursday in last week.

STAINED GLASS.

PETERBOROUGH CATHEDRAL.—The soldiers' memorial window now inserted in Peterborough Cathedral West Front will be unveiled by Lord Roberts on Tuesday next. The subjects are Peada, the founder of the early church at Peterborough, St. Peter, St. Paul, and St. Andrew, to whom the church was dedicated, and St. Ethelwold, of local renown. These form the upper tier. In the lower five are St. George, St. Michael, St. Alban, Joshua, and Gideon, warriors, who are typical of the Memorial character of the window. In the stone arcade below are brass tablets inscribed with the names of the local fallen in the South African War. The design is by Mr. G. F. Bodley, R.A.

The Bishop of Oxford opened, last week, new schools for the parish of St. Mary and St. John, Oxford. The cost of the block with the site was rather more than £6,000.

The Aston District Council had a special meeting recently to consider the report of the Tramways Committee with regard to the electrification of the tramways in the district. The committee had considered two alternative schemes, and recommended that a double line of tramway be constructed along Aston-road from the city boundary, Aston-road North, and Lichfield-road, with a single line under the railway bridge at Aston station, and a double line of tramway in Victoria-road from the Vine Inn to the Six Ways, the work to be executed by Mr. George Trentham, of Birmingham, at an estimated cost of £32,500. The report was adopted.

In continuation of their plan to form a new street from the pier to the railway-station, the corporation of Douglas, Isle of Man, have resolved to purchase additional property along the line of route. The engineers for the new reservoir at West Baldwin reported, at the last meeting of the town council of Douglas, that 136,000 cubic yards of earthwork had been placed in the embankment, leaving 36,000 cubic yards still to be done. One hundred and ninety men are employed. The outlay has been £51,676. The value of the work done, based on the original price in the engineer's estimate, is £35,593.

The buildings connected with the Industrial Exhibition at the east end of Glasgow were inaugurated last week. The ceremony took place in the main hall of the permanent buildings, which are situated off Whitehill-street, in Dennistoun. The guarantee fund amounts to nearly £15,000. The spaces for exhibits have been largely taken up, and most of the leading industries, not only of Glasgow, but of Scotland and part of England, will be represented.

The Committee of the Museum of Fine Arts at Boston, Mass., have erected on the site of its new building on the Fens an experimental structure, consisting mainly of a large movable skylight some 50ft. above the ground, which is to be used for determining the best position and the best lighting for the skylight of the future picture-gallery.

The Board of Trade has approved of the plans for the construction of tramways, on the conduit system of electric traction, from Camberwell Green to near the junction of Lordship Lane and Crystal Palace-road, as well as of a line at Denmark Hill, connecting the above with the tramway through Coldharbour-lane, promoted by the London County Council.

At a meeting of the Newcastle-on-Tyne City Council on Friday, it was agreed to adopt the recommendations of the Trade and Commerce Committee relative to the improvement and extension of the Newcastle Quay, at an expenditure of £559,000. The plans and report were prepared by Mr. Elge, the city engineer.

The chairman of the Hendon Urban District Council dedicated on Wednesday the public park for Hendon, which has been purchased by the local authority at a cost of about £7,500. Comprising 30 acres, the ground is situated in the centre of the parish.

The ancient church of Lady St. Mary, Wareham, Dorset, was reopened on Friday, after restoration carried out under the supervision of Messrs. Crickmay and Sons, architects, of Westminster and Weymouth. The whitewashed ceiling has been removed, and a new open roof provided. Perpendicular in character, with moulded principals, purlins, and wind braces, the whole in pitch-pine, covered with slates. The removal of the ceiling has brought to light a small east window, which will be filled with stained glass from the studio of Messrs. Percy Bacon Brothers.

Mr. Alfred Leader, of Kingsthorpe, Church-road, Forest-hill, who died on August 7 last, aged 49 years, of the firm of Messrs. John Williams and Co., of Dinorwic Slate Wharf, Rotherhithe, marble, slate, and cement merchants, left estate valued at £36,264 19s. gross, and the net personality at £35,432 14s. 6d. The testator, besides family bequests, gave to two clerks in the employ of his firm £500 each, to two other clerks £200 each, to an office boy £25, and £15 each to two carmen.

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ILLUSTRATIONS.

A PROPOSED TOWN CHURCH IN THE MIDLANDS.—COUNTY OF LANARK DISTRICT OFFICES.—PORTER'S HALL, SHENLEY, HERTS.—"FAWSIDE," CURRIEMUIR END, COLINTON.—LANCASHIRE AND YORKSHIRE BANK, BOLTON.—NEW POST-OFFICE, BOLTON.—NEW POST-OFFICE, MIDDLETON.—NATIONAL EISTEDDOD OF WALES.—DESIGN FOR A SEMI-DETACHED VILLA.—OLD GERMAN CHAIR AND TABLE.

Our Illustrations.

PROPOSED TOWN CHURCH FOR THE MIDLANDS. This scheme includes much of the existing fabric, although the work really comprises the practical reconstruction of the entire church. When finished, the building will present an entirely different character to the present one, and will make an eminently well adapted arrangement for modern church services. The interior is broadly treated with good fields of wall and roof space for decoration, the crossing being surmounted by a dome. The high altar is brought forward in the apse, as it should be for appropriate effect, a massive stone-built screen supporting a range of statues being located between the sanctuary and the organ, which is placed eastward of the screen on either side of the apse. The choir stalls, however, occupy the usual position—north and south of the presbytery. Mr. Walter Aston, F.R.I.B.A., of Manchester and Macclesfield, is the architect. The interior shown by our double-page plate is by Mr. John Langham.

COUNTY OF LANARK MIDDLE WARD DISTRICT OFFICES, HAMILTON.

This building has lately been erected to meet the wants of the Middle Ward of the County. The site adjoins the Old County Buildings and Court-houses, with which the new offices are designed to correspond; but in the new work the details are treated more freely. The stone in the building is a cream-coloured sandstone from Auchenheath Quarry, and the staircase is of a greyish-white sandstone from Overwood Quarry, both in Lanarkshire. The architect is Mr. Alex. Cullen, of Brandon Chambers, Hamilton. We shall at an early date give the committee-room of the same building.

OUT-BUILDINGS, PORTERS PARK, SHENLEY, HERTS.

The exterior of the Cowhouse is faced with cement, roughcast. The walls in the courtyard are built in white Flettons with red brick dressings. The roof is of Tiberthwaite slates. The turret, which is of oak, is surmounted by a copper dome with a wrought iron vane and copper finial. The builders were Messrs. Simpson and Son, of 48, Paddington-street, W. The Electric Light Engine House is built in Luton grey bricks with red brick dressings, and roofed with green slates. Accommodation is provided on the first floor for a resident engineer. The builders were Messrs. Simpson and Son, of 48, Paddington-street, W. The Cottages, built for farm labourers, are constructed of red brick and half-timber work, and roofed with hand-made tiles. The builders were Messrs. Boff Bros., of Park-street, St. Albans. The Stud Farm is built in white Flettons with red brick dressings and roofed with old tiles. The builders were Messrs. Miskin and Sons, of St.

Albans. The above were erected from the designs of Mr. C. J. Harold Cooper, and the originals of our reproductions were exhibited in this year's Royal Academy.

"FAWSIDE," CURRIEMUIR END, COLINTON.

This house, which has recently been erected for Mr. J. G. Scott, is built of Lancashire pressed bricks, with Raabon tile roof; half-timber is painted black, but barge-boards, windows, &c., are ivory white. The house is so arranged that the kitchen and servants' rooms overlook only the kitchen garden. Mr. Edward C. H. Maidman, of Edinburgh, is the architect.

NEW PREMISES, DARWEN STREET, BLACKBURN.

This building is being carried out for the Lancashire and Yorkshire Bank, Limited, from the designs of Messrs. Stones and Stones, architects, Richmond-terrace, Blackburn, and North John-street, Liverpool, by Messrs. E. Lewis and Sons, builders, Grimshaw Park, Blackburn. The chief elevations—viz., to Darwen-street and Market Street-lane—are faced with local stone, and all the dressings are also from the local quarry, known as Butler Delph. This stone is a bright yellow in colour, and stands the trying weather conditions peculiar to this part of the country very well indeed. The floors are all fire-resisting, and all the walls of good substantial thickness. The main roofs are to be covered with grey-green slates from Kirkby Ireleth Quarries. The tower roof will be covered with copper.

NEW PREMISES FOR THE MIDDLETON CORPORATION FOR POST OFFICE AND TENEMENT OFFICES.

This building is being carried out from the designs of Messrs. Stones and Stones, architects, Richmond-terrace, Blackburn, and North John-street, Liverpool. It is intended to provide on the ground floor the post-office for Middleton, and on the upper floors will be offices for letting. Part of these will probably be occupied by the Corporation officials. The tender of Messrs. W. A. Peters and Sons, of Rochdale, has been accepted for carrying out the work.

PRIZE DESIGN FOR A VILLA.

This design was awarded the first prize at the National Eisteddod of Wales, held at Llanelli last month. The only conditions issued were that special reference was to be given to sanitation and ventilation, and the cost was not to exceed £750. PERCY THOMAS.

CHIPS.

The new public baths at Bramley, Leeds, are approaching completion. They comprise a large swimming-bath, first and second-class slipper-baths for both sexes, and a Russian bath. The swimming and first-class slipper-baths are provided with shower-baths. The architect is Mr. J. Lane Fox, Leeds and Dewsbury.

Queen's-street Wesleyan Church, Scarborough, after having been closed for five months, and undergone extensive improvements, at an outlay of £3,000, has been reopened.

The authorities at Windsor Castle are engaged in the reconstruction of drainage works prior to His Majesty's arrival for his November visit.

Mr. A. D. Price, M.Inst.C.E., inspector of the Local Government Board for Ireland, has held an inquiry at Bray, Co. Wicklow, respecting an application of the urban district council for sanction to a loan of 18,500 for the purpose of enabling them to carry out schemes under the Housing of the Working Classes Acts. It was stated that in one of the districts of Bray 60 labourers' dwellings had been taken down as being unfit for human habitation. With regard to Little Bray, 81 families had only one room each. In Purcell's Field 200 persons occupied 36 houses. As regards sanitary arrangements, 126 labourers' dwellings in Bray had no sanitary accommodation whatever.

New schools are about to be built in Lomax-street, Rochdale, in connection with St. Patrick's Roman Catholic Church. The schools will accommodate 640 children in three departments, and will cost about £6,000.

The bridge constructed by the Pennsylvania Railroad Co. between Trenton and Morrisville across the Delaware River has just been opened for eastbound traffic. The length of the new structure is 1,080ft., and its width 55ft. The bridge is wide enough for four parallel tracks. The actual cost was £200,000 sterling; but about half a million sterling additional was spent on approaches and in removing several grade crossings.

COMPETITIONS.

BIDEFORD.—At Monday's meeting of the Town Council of Bideford correspondence was read which had taken place between the town clerk and Mr. Dunn, of Birmingham, whose competitive plans for free library and municipal offices were recently accepted, in reference to the big increase in the price of the tenders over the estimated cost. The town clerk, writing Mr. Dunn, said the council were surprised to find that some of the tenders exceeded nine thousand pounds, the local tenders—Messrs. Ellis, £6,300, and Messrs. Glover, £6,215 11s.—being the lowest. They desired to draw his attention to the fact that his estimate was a total of £6,130. Deducting from this the clerk of the works' salary, architect's commission, cost of loan and premiums, &c., it would be seen that after allowing £500 for extras, the lowest tender was about £600 above his figures. Even then the sum included in his (Mr. Dunn's) £2,000 for library fixtures was not taken into account. The council were desirous of discussing the matter with him, but in the meantime they wished to know whether it was in any way possible to cut down the figures without materially impoverishing the buildings. In conclusion, the town clerk added that the financial question was a very important one, and the council would not care to embark on any scheme involving an outlay of more than £6,000 to include all outgoings. Mr. Dunn, in reply, said the difference in the several tenders might be explained by the fact that in many ways it would cost builders from a distance more to do the work than it would firms nearer home. Although originally he did not expect his estimate of £6,130 to be exceeded, there had since arisen several matters quite unforeseen in connection with the buildings, site, &c., which would to some extent account for the additional cost. It might be possible to omit a few items without impoverishing the buildings, but they were not many. After some discussion the question was referred back to the committee.

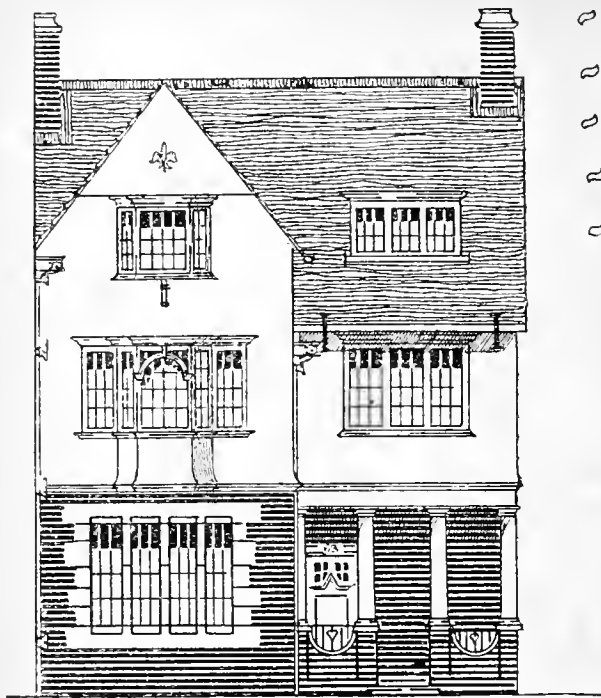
HERNE HILL, S.E.—At the last meeting of the Lambeth Borough Council, a report was received from the Libraries Committee recommending the issue of advertisements inviting designs for the new Herne Hill library buildings, the applicants to be limited to architects residing in Lambeth. Originally the proposal was to give the work to Mr. Sidney R. J. Smith, F.R.I.B.A., but the council referred the matter back, so that many designs could be seen and a selection made. The recommendation was adopted.

MADRID.—Competitive designs are invited for a casino, to be built in Alcada-street, one of the main thoroughfares of Madrid. A premium of 20,000 pesetas (about £330 sterling) is offered for the plan placed first. "Should the author of the project be a Spaniard," the official report states, "he will be charged with the direction of the works, with the fees and under the conditions that are fixed hereafter. If a foreigner, besides the 20,000 pesetas offered for the property of the project, he will receive 7,500 pesetas, half of the fees assigned for the direction of the works, the society being at liberty to appoint any Spanish architect to take charge of them." The managing committee invite designs to be sent in by Dec. 15, and each project must include a specification, plans, tender, and estimate.

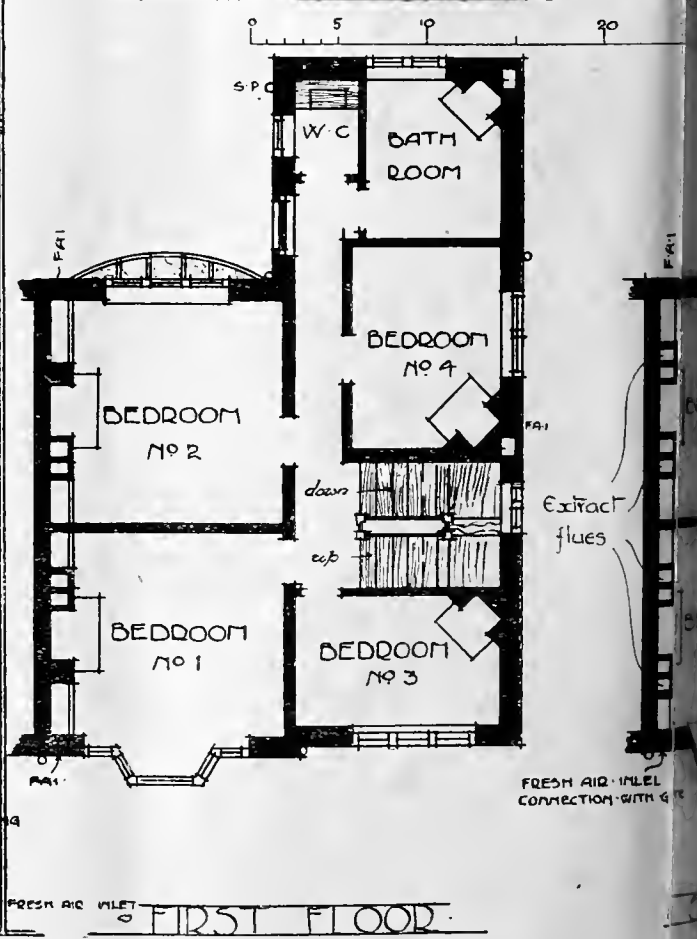
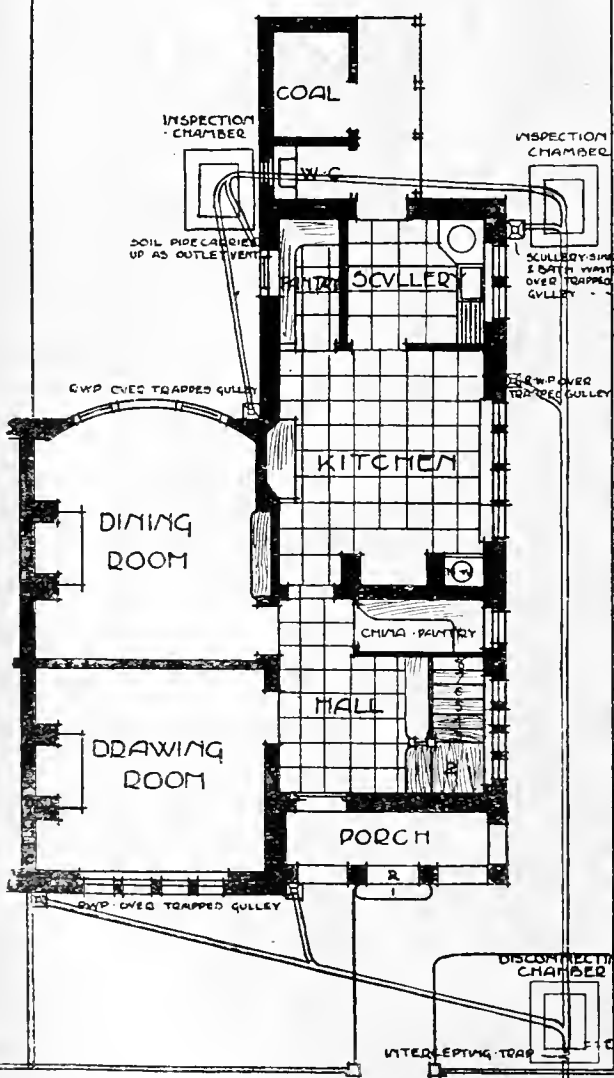
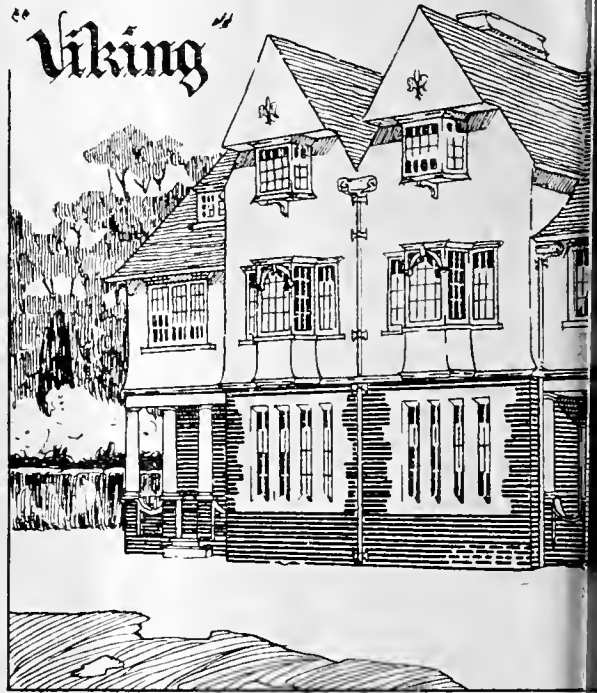
The promenade from Seacombe to New Brighton, which has recently been completed, is over two miles in length, and the three ferries are linked together without a break. The construction of the Seacombe extension occupied about two and a half years. The Parliamentary estimate of the cost was £45,000, and the expenditure comes well within that figure.

The memorial to be erected at Chatham to the officers and men of the Royal Engineers who fell in the South African War will take the form of an arch, similar to the Crimean Memorial Arch which stands at the entrance to the Royal Engineer Barracks. A site for the memorial has been chosen in front of the Royal Engineer Institute at Brompton. A monument to include four large bronze effigies of Boers, brought home from South Africa by Lord Kitchener, was originally proposed; but in deference to a wish expressed by many members of the corps, this idea has now been abandoned. The four effigies were a part of an intended memorial to Mr. Kruger at Pretoria.

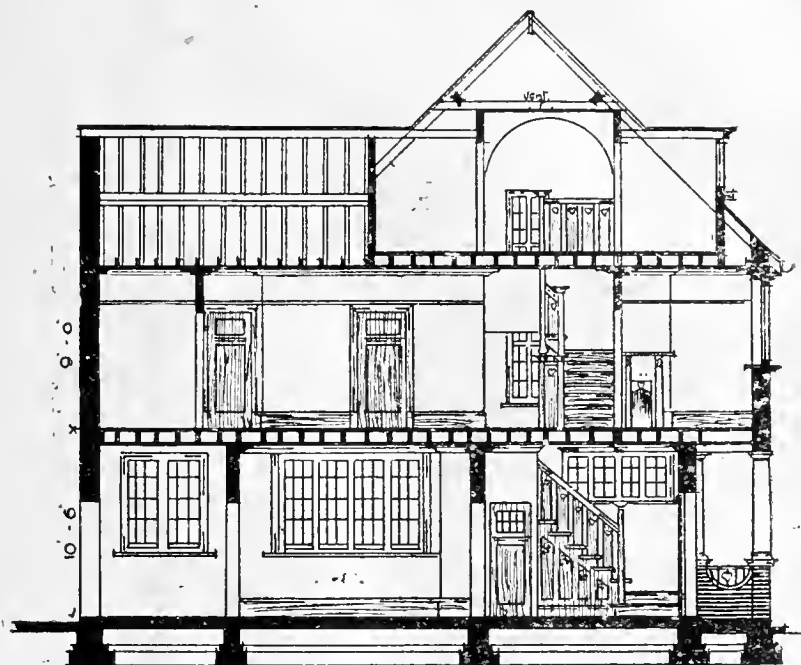
The town council of Devonport have passed, *nem. con.*, a resolution stating that where a contractor fails to observe the standard rate of wages and hours of labour he shall be fined £5 for every £100 in the value of a contract up to £1,000.



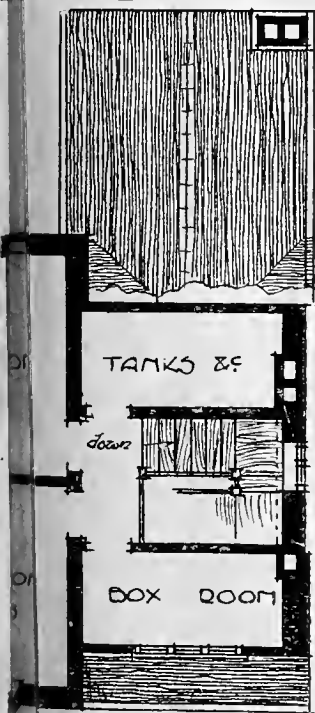
"NATIONAL" EISTEDDFOB
 OF WALES
 DESIGN FOR
 A SEMI-DETACHED V
 BY "Viking"



GROUND PLAN



SECTION



FIRST FLOOR



SIDE ELEVATION

Percy Thomas
Cardiff
 1903

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., L., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.). To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Situations and Partnerships.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—W. H. and Co.—M. R. S.—K. L.—I. G. T.—G. O. R.—M. A. P.—L. I. T.—H. W. and Son.

Correspondence.

SWANSEA COMPETITION FOR HOUSING THE WORKING CLASSES.

To the Editor of the BUILDING NEWS.

SIR,—In June last designs were sent in for this competition. Have any of your readers heard anything of a result or decision? Is this "affair" to add another story to the mighty monument of bogus competitions?—I am, &c.,
Sept. 22.

AD. REM.

The King has promised to present a new lectern to Portsmouth Parish Church, now undergoing restoration. The lectern will be of gunmetal, and will be the only one made of that material in any church.

The City Corporation has purchased for its permanent collection of pictures at the Guildhall Art Gallery a painting entitled "Mowing Bracken," from the brush of Mr. H. La Thangue, A.R.A. The picture, which has been hung in one of the upper galleries, was exhibited at the last Royal Academy.

Intercommunication.

QUESTIONS.

[12007].—**Electrical.**—Can any of your readers inform me which is the best book on electric wiring and lighting generally (elementary)?—A. G. S.

[12008].—**Normandy.**—What are the best places to visit upon the adjacent mainland during a short sojourn in Jersey? I believe facilities offered for crossing from the latter island *via* Gorey are excellent.—AN ARCHITECTURAL TAIPPER.

REPLIES.

[12003].—**Private Street Works: Apportionments.**—There can be no doubt that A should pay for 82ft. run, the width to be half that of the bottle neck. The return measurements should not be charged.—H. LOVEGROVE.

[12004].—**Reservoir.**—You can see in most libraries Longman's "Notes on Building Construction." Part 4 has what you want, chap. xiv., Retaining-walls for Water. There are many pages worth perusing, rules and illustrations.—REGENT'S PARK.

[12004].—**Reservoir.**—I would suggest to "G. W. C." that he should cover his reservoir and construct it entirely with cement concrete. If he likes to pay me a visit, I shall be pleased to show him three tanks that I have constructed in this material that answer extremely well. The whole of the tanks I refer to are above ground, and are constructed with cement concrete walls 6in. thick and floor 3in. thick. I think "G. W. C." would find this mode of construction not only very satisfactory, but cheaper than any other material he can employ. If "G. W. C." likes to communicate with me, I shall be pleased to give him full details. I send herewith a sample of the material I have used for you to forward to your correspondent.—HENRY KETTLERY, Barton Court, Abingdon.

[If the querist sends on three stamps and his address we will send him the sample.—ED. "B.N."]

[12005].—**Pastel.**—A Pastel is a crayon made of a paste composed of a colour ground with gum water. A crayon is made of compressed chalk or coloured earths.—REGENT'S PARK.

[12005].—**Pastel.**—There is really very little difference between the two. The word crayon means chalk. Black crayons are of Italian black chalk, a white crayon of French chalk, and some of red chalk are made in France. The word pastel means a little roll or cake, and is made of fine pipeclay, gum-water, and the required pigment.—H. L.

[12006].—**Distance of Adjoining Buildings.**—If you get small work on "Light and Air," by B. Fletcher, of B. T. Batsford, High Holborn, you will see many points given. Lateral obstruction dealt with, p. 107, which seems to fit in with your case. The angle of incidence of light is dealt with, p. 89. Angle of 45° from point of sill of window to line of eaves of adjoining owner was generally taken as a fair guide; but it is not always adopted by the Courts, as you will find. Book well illustrated.—REGENT'S PARK.

[12008].—**Distance of Adjoining Buildings.**—In the County of London buildings can be placed quite close together so long as they do not touch; but it is very foolish, as the space between the walls is a receptacle for damp and wet. In the provinces some of the by-laws provide for parapets within a certain distance. In any position, if the buildings must be placed close together, one wall only should be built as a party-wall, with a parapet for the requisite height above the roofs. Every man has the right to build to the full extent of his own land, except in the case of frontage lines.—H. LOVEGROVE.

The German archaeological expedition to the island of Cos, in the Egean Sea, has discovered on the walls of a newly-unearthed building some account of the famous ancient medical school of Cos.

The work in connection with the erection of a new bridge across the River Tay at Kinclaven, Perthshire, near the foot of the famous Beech Hedge on the Marquis of Lunsdown's Meikleour estate, has been in progress for some weeks past. The bridge, which is to take the place of the ferry boat at present in use, will consist of six concrete arches, with stone facings and parapets and concrete coping, and will have a roadway 16ft. wide. The whole work has been contracted for by Messrs. Young, Ltd., railway contractors, Glasgow. The plans are by Mr. Harrison, C.E., and advice in their preparation was given by Sir John Wolfe Barry. The bridge will cost £6,000.

The Chepstow Urban District Council have instructed Mr. Harry W. Taylor, A.M.I.C.E., to thoroughly examine and value the works and undertaking of the Chepstow Water Company, with a view to purchasing them.

Messrs. J. B. Joyce and Co., Whitechurch, Shropshire, have received instructions to make a striking clock with three illuminated dials, for Wootton Hall, near Ashbourne, Derbyshire, the residence of the Hon. Henry Bourke. The same firm have just completed the fixing of a large clock at Pitminster Church, Somerset.

Mr. Cameron Corbett, M.P., having acquired the lands of Thornliebank, formerly the property of the late Mr. Alexander Crum, M.P., has presented 136 acres of picturesque land as a public park for Glasgow. The grounds are situate five miles south of Glasgow Royal Exchange, and cost the donor, together with the mansion which is included in the gift, £24,000.

STATUES, MEMORIALS, &c.

CRATHIE, N.B.—A Queen Victoria memorial was unveiled by the King on Sunday at the comparatively new parish church of Crathie, in which Royalty is accustomed to attend Divine service while the Court is in residence at Balmoral Castle. Quite recently his Majesty substituted for its blue elates a roofing of red tiles, while within the edifice he has erected memorials to his mother as well as to his late brother the Duke of Saxe-Coburg and Gotha, and his late sister the Empress Frederick of Germany. In addition, he has finished off the pulpit with a canopy of carved wood. The memorial to Queen Victoria takes the form of a portrait bust, set in a niche on the face of the massive granite pillar that marks the angle of the choir and the south transept, in which is the Royal pew, the very pillar, by the way, at the lower part of which the late Queen laid the foundation-stone of the church with her own hands in 1893. The bust itself is of white Carrara marble, whilst the niche and its supporting bracket and surmounting canopy, which, like the church itself, are Scottish Decorated in treatment, are hewn out of Aberdeenshire granites of various hues, the greys of Dossie and the corals of Donside being intermixed. The leading feature in the composition is the richly-carved canopy, pierced with tracery and finished with a battlemented cornice. The bust, which is the work of Mr. Emil Fuchs, of London, represents her late Majesty wearing a crown with veil falling gracefully on to the shoulders over the robes and the Order of the Thistle. The memorials to the Duke of Saxe-Coburg and Gotha and the Empress Frederick consist of medallion portraits let into the wall on each side of the south or Royal transept, adjoining the tiny stained-glass window inserted in the church by Queen Victoria to perpetuate the memory of Prince Henry of Battenberg and the late Duke of Clarence. The medallions of white statuary marble are so disposed as to fill in the upper part of an oblong tablet of dark grey marble framed in Caen stone. The new oaken pulpit canopy, which can be raised or lowered by a wrought-iron and brass chain, harmonises with the architecture of the church, and bears around its sides the emblems of the New Testament writers in proper colours.

CHIPS.

The 20th general annual report by the Board of Trade under section 131 of the Bankruptcy Act, 1883, just issued as a Parliamentary paper, shows a decrease in the number of failures as compared with the previous year of 106. In the building trades the failures showed a total for the year of £621,154, a decrease of £121,041 on the previous year's return.

Glasgow University Court have decided to proceed with the present extension operations, involving an expenditure of £100,000, without altering the sites or designs, as requested by an influential opposition.

Liskeard Corporation has purchased the Trehawke estate for the sum of £2,570.

The foundation stone of the new municipal offices which are being erected for the corporation of Crewe was laid on Wednesday by the Mayor of Crewe. The total cost of the buildings, with furniture, will be about £18,000. Mr. Henry T. Hare, P.A.A., F.R.I.B.A., whose design, selected in competition, was illustrated in the BUILDING NEWS for May 8 of this year by elevation, plan, and perspective, is the architect.

At the meeting of the Croydon Corporation on Monday, Mr. George Fearnley Carter, who has for four years acted as assistant engineer to the corporation, and who has had previous experience at Leeds, was elected chief borough engineer. The commencing salary is £800 per annum, rising to £1,000 in two years.

The first tenants of the new market hall for Leeds opened their shops on Saturday morning, though not for six or seven months will the building be completed. The hall is being erected from plans by Messrs. Leeming and Leeming at a cost of about £100,000. We have illustrated the hall in our issues of April 26, June 21, and Sept. 13, 1901.

Lord Windsor, the First Commissioner of his Majesty's Works and Public Buildings, has appointed Mr. Louis Parkes, M.D., to succeed the late Professor W. H. Corfield as consulting sanitary adviser to the department.

The Bishop of Winchester will consecrate, on Wednesday in next week, the 30th inst., the church of All Saints, near Windlesham, which has been built by Mrs. Christie in memory of her late husband, Mr. R. C. Christie, of Manchester.

Mr. Hodgson, the Director of Railway Construction, Public Works Department, Government of India, has issued a circular to all engineers employed on large works, with time and opportunity at their disposal, asking them to experiment with a process just discovered in America for increasing the tenacity of clay by mixing it with the liquid obtained from boiled straw.

LEGAL INTELLIGENCE.

BRADFORD CITY CORPORATION STREET IMPROVEMENTS.—At the town-hall, Bradford, on Friday, September 18, Lieut.-Colonel W. W. Wellsted, Mem. Inst. C.E., of Hull, sat as sole umpire to determine the price to be paid to Messrs. Hameyer and others in respect of their interest as owners of certain property in Church Bank, Bradford, for the purpose of widening Church Bank. The claimants' counsel was Mr. Ernest Pollock, instructed by Mr. Elliott Smith, of Mansfield, and Mr. W. Waugh represented the corporation, instructed by the town clerk. The claimants' witnesses were Messrs. F. Hameyer, D. Fell, E. Vallance, F.S.I., Mansfield, S. Jackson, and Thos. Fenwick, Leeds, who placed the value at £1,929. The corporation witnesses were Messrs. W. B. Woodhead, Robt. Hudson, R. Armistead Bradford, who valued the land taken and the injury to the premises left at £457. The umpire reserved his decision.

IN RE LIGHTBOUND, RIGBY, AND CO., LIVERPOOL.—A meeting of the creditors of Charles Latham and Ralph Norbury, trading together as Lightbound, Rigby, and Co., at 170, Regent-road, Liverpool, and at other addresses, timber merchants, and also as the Saginaw Lumber Company, of 8, Victoria-street, Liverpool, was held on Wednesday at the Exchange Station Hotel, in that city. Mr. Harvey was voted to the chair, and Mr. Denton, chartered accountant, presented a statement of affairs. It showed the total liabilities to be £142,333 10s. 5d., of which £78,761 were unsecured, and of this amount £67,897 was on account of Lightbound, Rigby, and Co., and £10,864 9s. 2d. on account of the separate business of the Saginaw Lumber Company. The creditors fully secured were £55,156, and the amount of securities held by them was estimated at £93,034. Partly secured creditors figured for £5,936, and the assets held by them stood at £4,966, leaving a deficiency of £1,000. The total net assets were returned at £80,143, showing a surplus over the net liabilities of £1,382. Mr. Denton stated that the firm's difficulties appeared to have been brought about by their purchase and development of a large building estate at Oakhill, Old Swan, Liverpool, into which from time to time all the available resources of the firm had been diverted. At present, however, only about one-third of the estate had been realised, and in the opinion of competent valuers it was fully worth the value put upon it in the statement. The realisation of the estate would depend mainly on the manner in which this property was dealt with. A committee was appointed to consider the whole matter and report to the meeting, which was adjourned for that purpose to that day week.

IN RE F. E. BEST, ASHFORD, KENT.—Under the failure of Frank Edward Best, of Ashford, East Kent, builder, carrying on business under the name or style of "E. Dryland and Co.," the statement of accounts shows gross liabilities amounting to £1,773 13s. 6d., and unsecured liabilities £505. The net assets are estimated to realise £1,210 13s. 2d., thus showing a surplus of £705 13s. 2d. The causes of failure are stated to be losses incurred owing to delay in obtaining money on contracts.

A new Gospel hall in Station-road, Clevedon, Somerset, was opened on Friday. It is faced with Cattybrook bricks and Pensat stone, and is seated for 250 persons. Mr. Joseph E. Taylor is the architect and Mr. W. A. Green the builder.

The death is announced of Mr. John Fecitt, of Blackburn, who had lately returned from an American trip. He was the head of a firm of builders and contractors, and was a member of the Blackburn Town Council.

Birmingham crematorium is now to all intents and purposes complete, and is ready to be put into operation. The opening ceremony will probably take place on either October 6 or 7, when it is expected that Sir Henry Thompson will be present.

Mr. Alfred S. Blackman, M.I.C.E., who has for four years been electrical engineer to the Metropolitan borough of Poplar, has been appointed by the electricity committee of the Bradford Corporation to the position of electrical engineer, formerly held by Mr. Chattock, at a salary of £600 a year. Mr. Blackman is 33 years of age.

The urban district council of Honiton have appointed Mr. Hayter, late assistant surveyor of Bitterne, Southampton, to the post of borough surveyor.

St. Chad's Church, Bensham, Gateshead, will be opened on Tuesday in next week. Mr. Beall is the contractor for masonry, the woodcarving has been executed by Mr. Ralph Hedley, of Newcastle, while the internal east wall of the chancel is being decorated in fresco secco by Mr. J. Edie Reid, the subject being the Annunciation.

The town council of Musselburgh have adopted plans by Mr. George Landale, their borough engineer, for a fever hospital, estimated to cost £5,950, being at the rate of £375 per bed.

WATER SUPPLY AND SANITARY MATTERS.

BIRMINGHAM CORPORATION WELSH WATERWORKS.—The council of the Institution of Mechanical Engineers visited the new reservoirs at Rhayader, on Wednesday week, on the invitation of Mr. James Mansergh, F.R.S., engineer to these new waterworks of the Birmingham Corporation. The corporation have acquired 45,000 acres (71 square miles) of moorland embracing the watersheds of the Elan and the Claserwen rivers above Rhayader, Mid Wales, and are taking the water thence 80 miles to Birmingham. It is expected that water will be supplied from the new source in July of next year. The scheme when carried out will have cost £5,000,000. It includes the construction of solid masonry dams which back up the water of the two streams into a series of lakes, with the head of one lake reaching to the foot of the next higher dam. The lakes are used for the supply of Birmingham and for compensation to the riparian owners on the river Elan. A submerged dam retains a supply of water in the lowest lake for the special use of Birmingham. The total storage capacity of the lake is about 13,000 million gallons, and when full they will supply both the compensation water and the Birmingham requirements over a six months' drought. The cast-iron pipes leading to Birmingham are calculated to suffice for the supply of 1,000,000 persons, but the tunnels and aqueducts are sufficient to convey water for 3,000,000 persons when the whole watershed will be utilised.

WALLASEY SUPPLIED WITH LAKE VYRWY WATER.—By arrangement with the Liverpool Corporation a supply of water from Lake Vyrwy, Montgomeryshire, has been brought to an existing reservoir at Gorse Hill, New Brighton, and thence is carried by mains through Wallasey and Seacombe, where a population of 56,000 hitherto furnished with water from local wells in the red sandstone is being provided for. The great Vyrwy Aqueduct, constructed ten years since for the Liverpool Corporation, has been tapped at Hatchmere, and from that point a water main, 21in. in diameter, has been laid to the Wallasey district. This branch water line traverses a distance of 34 miles, the route passing from Hatchmere through the Delamere Forest, the townships of Manley, Picton, Stoke, Whithy, Hooton, Hinderton, Woodchurch, and Leasowe, into Wallasey. At many points of the route the main is carried under or over brooks, canals, bridges, and railways. Most trouble was occasioned by the passage of the Gowry River at Mickle Trafford, the main being finally carried underneath the stream by a siphon pipe. Another difficult part of the work was the crossing of the Chester and Birkenhead Railway lines at Hooton. The crown of the road bridge at this busy junction being insufficient to carry the large main, the latter has been split into a series of smaller pipes for the actual crossing, these being reunited again on the other side of the railway into a 21in. main, whereby the water transport is continued to the Wallasey boundary in Leasowe-road. At this point a meter-house has been erected, and therein a suitable meter will mechanically reckon the toll which Wallasey must pay to Liverpool for the Welsh water. From the Leasowe meter-house the main is continued for the present to the existing reservoir at Gorse Hill. This reservoir is capable of holding only 2,000,000 gallons, but alongside is now in course of construction a reservoir to accommodate nearly 4½ million gallons more, and here eventually the Vyrwy water will be stored. Under the agreement with the Liverpool Corporation Wallasey borrowed a sum of £146,000 to provide the 34 miles of main from Hatchmere to Wallasey, and the Wallasey Urban District Council borrowed £17,500 to carry on the main a further three miles through their own district to their own reservoirs. That £146,000 has to be repaid by Wallasey in thirty years at the rate of 6½ per cent. per annum. The line has, however, actually been constructed at a substantially less figure than the £146,000 originally estimated as the cost. Wallasey has agreed to take of the Vyrwy water a minimum supply of 500,000 gal. a day, and to pay 6d. for every 1,000 gal. Every year, therefore, Wallasey must also pay to Liverpool for water supplied £4,562 10s. In addition to these two items, Wallasey has to repay an additional annual sum of £2,259 on account of loans of £27,000 for the Gorse Hill new reservoir and tower, and £21,000 for the home line of the Vyrwy main and other pipe line extensions. Wallasey may supply other districts with the Vyrwy water on obtaining the consent of Liverpool, which is not to be unreasonably withheld. Already under this clause Wallasey has arranged to supply the Hoylake Water Company if and when necessary. The whole work of laying the 21in. water main from Hatchmere to Wallasey, and the further three miles to carry on the supply to the reservoir and high-level water-tower at Gorse Hill, New Brighton, has been executed by Messrs. Holme and King, the contractors, within eighteen months. The Wallasey portion of the works has been carried out under the direct supervision of Mr. J. H. Crowther, water engineer to the council, who also took a practical part in the task of surveying and selecting the route for the Vyrwy branch main.

Our Office Table.

The London County Council has decided not to promote a Bill in Parliament next session for the purpose of securing the amendment of the Building Acts. The somewhat crude Bill brought forward last year was so fiercely assailed by interested parties that, as it will be remembered, it was withdrawn. The time for giving notice of such a measure has passed by, and, in view of recent expressions of opinion at County Hall, no request will be made to suspend the Standing Orders. The Bill is, however, only set on one side for a while, and in all probability a year hence the committee concerned will submit their draft suggestions.

MR. ARNOLD-FORSTER, M.P., will open the Autumn Exhibition at the Whitechapel Art Gallery on Tuesday week, Oct. 6, at 3.30 p.m. The exhibition will illustrate "Shipping" on its various sides, historical, mechanical, and artistic. The King is lending models and pictures, and the Prince of Wales more than twenty models, amongst which are some of his famous silver "nefs." The Victoria and Albert Museum, the United Service Institution, and the corporations of Ipswich and Liverpool are among the contributors, as well as many of the large shipping companies. Special attention will be paid to the historical development of shipbuilding, and many interesting models and prints of the 17th, 18th, and 19th centuries have been promised. The Director would welcome any offers of loans of models and pictures which would enable the committee to carry out their project effectively. The exhibition will entail heavy expenses, and donations are asked for from those interested in a subject of such vital national importance as the shipping industry.

It is proposed to found a society analogous to those already existing in Paris and Berlin, with the object of presenting pictures and other works of art to the national collections. A provisional body has been formed to promote this object in the United Kingdom. A meeting will be held during the autumn, when definite proposals will be made, and supporters of the movement will be invited to nominate a council and an executive committee. The scheme has received sympathetic encouragement from the heads of the national collections. Broadly speaking, the proposal is to enrol as many members as possible by whom an annual subscription of one guinea will be paid. It is anticipated, however, that members may be willing to contribute donations in proportion to their interest and means. Such donations may be allocated to any of three separate funds:—(1) For ancient pictures and drawings, (2) for other ancient works of art, (3) for modern works of art. The executive will appoint purchasing committees, in whom a certain discretion will be vested. From time to time it may be found necessary to issue appeals, inviting contributions towards the acquisition of objects of unusual importance. It is hoped that the fund may become a further channel through which gifts, bequests, and memorial presentations may be made to the national collections. The difficulties and delays caused through large committees having to sanction the purchase of any single work of art have led those who are responsible for this scheme to provide that the purchasing committees shall appoint honorary buyers, to whom the maximum of discretion will be delegated. Mr. E. W. Beckett, M.P., is the treasurer *pro tem.*, and Messrs. Isidore Spielmann, F.S.A., and R. C. Witt are the hon. secretaries, *pro tem.* The offices are at 47, Victoria-street, S.W.

A useful series of articles is commenced this week in the *Weekly Times* and *Echo* on "London Charities," giving much information never before published of various charities in connection with the various London parishes, notably Bethnal Green, Battersea, Bermondsey, Camberwell, Greenwich, Hackney, Hampstead, Lambeth, Lewisham, Limehouse, Paddington, Holborn, Aldgate, Shoreditch, St. Luke's, Westminster, Deptford, Southwark, St. Pancras, Covent Garden, Whitechapel, Wandsworth, and others. It is surprising how little known is the existence of these funds by those for whose relief they were intended, and from whom, we fear, in too many cases their benefit is diverted.

SOME months ago the Monmouthshire County Council appointed a provisional committee to inquire into the working of the Education Act as

it would affect the Council. The committee appointed Messrs. Roberts and Swash, architects, of Newport, Mon., to report upon the condition of the voluntary school buildings throughout the county. Their report was submitted to a meeting of the provisional committee held on Friday. It characterises the general structural condition of these schools as unsatisfactory. The probable cost of putting the buildings into proper repair, as required by the Education Department, is considerable, and ranges in different cases from £10 to £500.

At the Associated Portland Cement meeting on Wednesday, Mr. F. A. White said that if the "wisdom and statesmanship" of the Government decided that duties on certain foreign imports were desirable, then cement was an article with a prior claim to protection. Economy, he said, had been accompanied by large expenditure on extensions and improvements of plant, amounting last year to £117,879, and this expenditure will have to continue for some time. So with the object of replenishing the diminished working capital the directors have arranged to create £120,000 of "capital expenditure certificates," bearing interest at 6 per cent., and to be paid off in 12 months instalments. They are now placing £100,000 of these certificates, and the balance will be issued as and when required. With reference to the current year Mr. White anticipated that the new Rotary plant at Swancombe would have a very important and advantageous bearing upon profits.

The School of Art Wood-Carving, South Kensington, which now occupies rooms on the top floor of the new building of the Royal School of Art Needlework in Exhibition-road, has been reopened after the usual summer vacation, and we are requested to state that some of the free studentships maintained by means of funds granted to the school by the Technical Education Board of the London County Council are vacant. The day classes of the school are held from 10 to 1 and 2 to 5 on five days of the week, and from 10 to 1 on Saturdays. The evening class meets on three evenings a week and on Saturday afternoons. Forms of application for the free studentships and any further particulars relating to the school may be obtained from the manager.

The Board of Agriculture have just published a "Memoir of the Geology of the Country around Torquay," price 2s. In this memoir is a full description of the Devonian strata and fossils, with notes on the volcanic rocks, and diagrams illustrating the complicated structure of the area. The New Red Sandstone Series, including the Watcombe Clay, and overlying conglomerates and breccias; the cavern deposits, raised heathes, and submerged forests, are likewise described, and there is a brief account of the economic products. The memoir is intended to accompany the lin. map-sheet 350 (new series) which was published in 1898, hand-coloured, price 3s.

On the property of Mr. Wingfield Digby, M.P., at Fifehead Neville, Dorset, have been found some remains of a Roman villa. In 1880 some indication of the site was discovered in an elaborately-designed mosaic floor, and through the action of Mr. Digby, who has borne the cost of the excavations, the remains have now been brought to light. They include several large tessellated floors, the tesserae being exceptionally small and of artistic design. The stone foundations of the walls of the villa have also been disclosed, together with the hypocaust and flues by which the winter living room was warmed. The excavations have been carried out under the superintendence of the Rev. G. Engleheart, of Salisbury. On Wednesday the site was visited by 100 members of the Dorset Field Club, with Lord Eustace Cecil, the president.

An exhibition of building improvements and decorative art was opened at the Brighton Aquarium on Wednesday by the Mayor. It has been promoted by the Aquarium Committee, with the co-operation of an advisory committee of local architects, presided over by Mr. C. E. Clayton. The principal object in view is to show the whole process of building in a series of illustrative exhibits, a specially attractive feature being the number of working exhibits. These include the printing and staining of artistic wall-papers, and the process employed in the making of art pottery, and the staining of glass; another corner of the exhibition being devoted to practical demonstrations of hammered ironwork. The architects of Brighton have filled one long gallery with a collection of architectural drawings, and the opera-

ting theatre has been given over to the Municipal Technical Schools and the School of Art, whose students not only exhibit specimens of their work, but are also seen practically engaged in terracotta modelling and in executing fancy brick archwork and other branches of technical instruction. The exhibits and practical working demonstrations occupy the whole available space at the Aquarium. Medals are to be awarded, and the task of allotting them has been delegated to a jury of local architects.

EASTON AND COMPANY, LTD., of Erith and Westminster, appear to be in difficulties. Mr. W. B. Peat, of 3, Lothbury, E.C., was appointed on the 16th inst. receiver and manager, and is carrying on the business under the direction of the Court. He is responsible for all orders given by him subsequent to the 16th inst., and creditors' claims previous to that date are to be sent to him.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Devon and Exeter Architectural Society. Excursion to Dartmouth. Visit to new Naval College under guidance of Aston Webb, R.A., F.R.I.B.A. Trains from Exeter at 8.40 a.m. and 10.50 a.m., from Millbay, Plymouth, at 10.30 a.m. 10.40 a.m.

FRIDAY.—Architectural Association. Annual meeting. Address by the President, Henry T. Hare, F.R.I.B.A.; Presentation of Prizes. 9, Conduit-street, W. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

OCTOBER 2nd. ANNUAL GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. Address by the President, Mr. HENRY T. HARE, F.R.I.B.A., and distribution of prizes, medals, and certificates.

Exhibition of Students' work, price and other drawings. COURSES OF INSTRUCTION IN ARCHITECTURE. The Day School will open on MONDAY, September 28th, at 9.45 a.m. Intending pupils are requested to forward their names to the Secretary as early as possible.

The Evening School also opens on the same date at 6.30 p.m. A pamphlet containing full information as to the Classes and advantages of membership may be obtained upon application to the Secretary, at 95, Great Marlborough-street, London, W. LOUIS AMBLER, Hon. Secs. H. TANNER, Jun., Hon. Secs.

The General Hospital, Cheltenham, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The new central school for defective children in Cloughton-road, Birkenhead, was formally opened on Friday. The building, which will accommodate 130 scholars, contains an assembly-hall, eight classrooms, doctor's room, and lavatories on the ground floor, with a dining-room and recreation-room on the upper floor, and teachers' dining-room. Mr. Chas. Wise, of Birkenhead, is the architect.

The memorial to Dean Farrar will take the form of stained glass to fill the great seven-light Perpendicular west window of the chapter-house of Canterbury Cathedral.

At the last meeting of the City Court of Common Council, the streets committee brought up a report on the question of the framing of new by-laws in connection with the pulling down of buildings in the City: together with suggestions by the Royal Institute of British Architects, the Surveyors' Institution, and the Institute of Builders. Sundry amendments were moved by Mr. Deputy Douglass Mathews, F.R.I.B.A., but by agreement the discussion of the report was adjourned until the next Court.

A Local Government Board inquiry was held at the Municipal Buildings, Liverpool, on Wednesday, with reference to the application of the city council for sanction to borrow £26,000 for the erection of public baths on land situate in Picton-road and Glynn-street, Wavertree.

The memorial window and tablets that have been placed in Bodmin Parish Church were unveiled by the Earl of Mount Edgcumbe (the Lord-Lieutenant of the county) on Monday. The stained glass is of 15th century character, and represents four warrior saints, while in the predella beneath is a battle scene. The tablets are of yellow Verona marble, inclosed in a framework of alabaster.

The memorial-stone of the new St. Alphonsus Church and Schools in connection with St. Wilfrid's, Hulme, will be laid by the Roman Catholic Bishop of Salford to-morrow (Saturday). The memorial-stone of the new presbytery will be laid at the same time. The cost of the church, house, and schools will be £6,000, and the total cost of the extensions at St. Wilfrid's, with the new buildings, will be £7,200.

The foundation-stone of the new chancel of the parish church at Ulverston was laid on Friday afternoon by Lady Evelyn Cavendish. The total cost of the alterations being made to the church will reach £2,000.

Trade News.

WAGES MOVEMENTS.

STOCKTON-ON-TEES.—The strike of plumbers at Stockton is assuming more serious aspects. The whole of the men employed in the town are out, and the building trade is becoming affected. The employers are trying to fill the strikers' places from outside. The men came out three weeks ago as a protest against an alleged violation of the working rules by one of the firms employing non-unionists.

THE WELSH SLATE TRADE.—The *Slate Trade Gazette* says that a communication from St. John's states that the Newfoundlanders are looking forward to the transfer to their colony of certain Welsh quarry firms. It is reported that one quarryman has under consideration plans for the removal of an entire town near his Welsh quarry to Newfoundland, where he can give 3,000 men employment. The communication adds that Welsh slate has been known as the best in the world, but experts who are prospecting and working Newfoundland beds on Trinity Bay and Bay of Islands say Newfoundland slate is superior to Welsh, besides being easier to quarry and almost inexhaustible.

CHIPS.

The Dolgelley Urban District Council have purchased the works and undertaking of the Dolgelley Water Company upon such satisfactory terms that, after buying the works and spending a considerable sum in improving and bringing them up to date, there will be sufficient profit from the commencement to reduce the rates by 4d. in the £. Mr. Harry W. Taylor, A.M.I.C.E., has acted for the council throughout.

The foundation-stone of the new Municipal Hall at Deptford will be laid by the Mayor of that borough on Wednesday, October 14.

M. Coquelin, the well-known actor, is said to have discovered a method of preventing fires in theatres. Details of his invention will not be made known until the patents for which he has applied are granted.

On Wednesday week the foundation-stones of the new mission church of St. Mark's, Duke-street, Leek, were laid. The cost of the new church will be about £1,000, and it will seat 250 worshippers.

Provost Halliday has intimated to Lochmaben Town Council that Mrs. Halliday and he are prepared to bear the expense of a sewerage system for the burgh. The offer will entail on the donors an expenditure of at least £1,500.

The Hall-i'-th'-Wood, near Bolton, which was built in the 15th century, and was for a time the residence of Samuel Crompton, the inventor of the spinning mule, has been turned into a museum, and up to the present £1,500 has been spent on the building by the corporation, to whom it was presented by Mr. W. H. Lever. The corporation are now about to borrow a further sum of £1,150 for the purposes of the museum, and a Local Government Board inquiry into the matter was held on Wednesday week.

The committee on tramways of Leith Town Council have resolved to recommend the council, when the tramways are acquired, to introduce electric haulage over the entire system.

The Church of St. John the Baptist, Hulme, Manchester, was recently reopened after being repainted and decorated. The colouring of the walls is a warm yellow (as to the upper portion), which brightens up the interior and brings into clear view the timber-work of the lofty roof. The lower portion is a warm reddish-brown, surmounted by a stencilled band (about 9in. high) of an intertwining vine-leaf pattern. In the chancel the ground colour of the walls is a warm yellow. The wall surface north and south is broken by arches, and between and above these arches it is ornamented with a vine-leaf and fruit design. In the intervening spaces are depicted soaring birds symbolising praise. The work has been carried out by Messrs. John Cantrill and Sons, under the direction of Mr. Gerald Cogswell, A.R.I.B.A.

The trustees for the improvement of the city of Bombay, at a special meeting, have appointed Mr. J. F. Watson, a candidate from England, as assistant engineer on Rs.400 per mensem. At present the board have under construction buildings of their own value of 12 lakhs of rupees, and their lessees are constructing others of the total value of 30 lakhs.

The members of the Devon and Exeter Architectural Society will have an excursion to Dartmouth to-morrow (Saturday). The President, Mr. A. S. Parker, A.R.I.B.A., will entertain the members at luncheon at the Castle Hotel, Dartmouth, at 1.15 p.m. Mr. Aston Webb, R.A., F.R.I.B.A., will attend and kindly show the party over the new Naval College buildings now in course of erection.

LIST OF COMPETITIONS OPEN.

Leyland, Lancs.—Laying-out Land (11,902 square yards)	£15 15s.	M. H. Wilkinson, Surveyor, 21, Towngate, Leyland	Sept. 26
Brighton—Hospital for Women (Assessor)	£50, £30, £20	Leonard Holmes, Hon. Sec., 76, West-street, Brighton	" 29
Dublin—Workmen's Cottages	£30 (merged), £20, £10	Francis B. Ormsby, Secretary, Kingsbridge Terminus, Dublin	" 30
Heywood—Library (£4,500)	£75 (merged), £25	J. Ainsworth Settle, A.M.I.C.E., Borough Engineer, Heywood	Oct. 1
Bromley, E.—Public Library	39gs.	Harley Heckford, A.M.I.C.E., Boro' Sur., High-street, Poplar, E.	" 2
Saltwood, Elham—Sewage-Disposal Scheme	£100, £50, £30	R. Loneragan, Clerk, 11, Cheriton-place, Folkestone	" 7
Rawtenstall—Free Library and Town Hall (Assessor)	50gs. (merged), 25gs.	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	" 12
Harrogate—Pump-Room and Colonnade in Valley Gardens	£100, £50, £25	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	" 23
Sunderland—Additions to Town Hall	100,000, 75,000, and 50,000 kronen	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	Nov. 21
Wakefield—Reconstructing Cattle Market		R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Vienna—Machinery to Lift Boats		The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Aylesford—Single-Span Stone Bridge over Medway (Assessor) 100gs		The Town Clerk, Maidstone	

LIST OF TENDERS OPEN.

BUILDINGS.

Wigan—Cemetery Extension Works	Burial Board	W. B. Johnson and Sons, Architects, 31, King-street, Wigan	Sept. 26
Saltburn—Wesleyan Church and Schools		Garside and Pennington, Architects, Pontefract	" 26
Sheffield—Excavating Site, Snig Hill		Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	" 26
Alnwick—Converting St. James's Manse into Sunday-schools		George Reavell, jun., A.R.I.B.A., Alnwick	" 26
Skewen—Rebuilding Cross Keys Inn	E. Evans Bevan	J. Cook Rees, Architect, Neath	" 26
Braemar—Additions to Invercauld Arms Hotel		Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen	" 26
Shenfield—Two Cottages		Lionel H. Marshall, Surveyor, Chippingham, Wilts	" 26
Scarborough—Primitive Methodist Chapel, Seamer-road	Corporation	J. Caleb Petch, Architect, Bank Chambers, Scarborough	" 26
Dublin—Pumping Station	General Purposes Committee	Spencer Hart, M.I.C.E.I., City Hall, Dublin	" 28
Nelson—Clock Tower on Market Hall		B. Ball, A.M.I.C.E., Borough Engineer, Nelson, Lancs	" 28
Linthwaite—Cowsheds		John E. Lunn, Architect, Milnsbridge	" 28
Gilfach Bargoed—Seventeen Houses	Park-place Building Club	Wm. Harris, Architect, Gilfach, Pengam, Wales	" 28
Maesycwmmwr—Additions to School	Bedwas School Board	J. H. Phillips, Architect, Clive Chambers, Windsor-place, Cardiff	" 28
Linthwaite—Alterations to Cottage		John E. Lunn, Architect, Milnsbridge	" 28
Romey—Works at Priestlands	Municipal Charities Trustees	The Architect, 14, Market-place, Romey	" 28
Fochriw—Ten Houses	Corporation	Wm. Walters, 5, Dynevor-street, Fochriw, Wales	" 28
Stockton-on-Tees—Cow-Byre	Urban District Council	Arthur B. Crosby, Town Clerk, Borough Hall, Stockton-on-Tees	" 28
Walthamstow—Corrugated Iron Sheds		G. H. Holmes, A.M.I.C.E., Town Hall, Walthamstow	" 29
Cork—Improvements to No. 16, South Mall	H.M. Commissioners of Works	Robert Walker and Sons, Architects, 17, South Mall, Cork	" 29
Ealing Dean, W.—New Sorting Office	Tynemouth Corporation	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 29
North Shields—Shops and Offices, Saville-street		John F. Smilie, Borough Surveyor, Tynemouth	" 29
Whitehaven—Six Houses, Wellington-row	Charles Horner	J. S. Moffat, M.S.A., 53, Church-street, Whitehaven	" 29
Halifax—Silversmith's Works	H.M. Commissioners of Works	Walsh and Nicholas, Architects, Museum Chambers, Halifax	" 29
Ealing, W.—Additions to Telephone Exchange	Trustees	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	" 29
Landore—Rebuilding Wesleyan Chapel	Borough Council	W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	" 31
Senghenydd—Baptist Chapel and School	Corporation	T. Nicholas, Secretary, Station House, Senghenydd, Wales	" 31
Hampstead, N.W.—Tenements, Lynton-road		O. E. Winter, A.M.I.C.E., Borough Eng., Town Hall, Hampstead	" 31
Pontypool—Rebuilding White Hart Hotel	Deri Building Club	Fisher and Sons, Architects, Pontypool	" 31
Bootle, Lancs.—Extension of Boiler-House	James Grafton and Co	B. J. Wolfenden, A.M.I.C.E., Borough Engineer, Bootle, Lancs	" 31
West Hartlepool—Primitive Methodist Church, Graege-road		Harry Barnes, A.R.I.B.A., Bank Chambers, West Hartlepool	" 31
Deri—Thirty-five Houses	Corporation	James Ward, Cascade House, Deri, via Cardiff	" 31
Knaresborough—Twelve Houses at Scriven	Lieut.-Col. Lord Wenlock	W. Rhodes Nones, Architect, 13, Market-street, Biogley	" 31
Longwick—Wesleyan Chapel and Schoolroom	Urban District Council	Fred Taylor, A.R.I.B.A., Temple-street, Aylesbury	" 31
Bradford—Office	Corporation	James Watson, M.I.C.E., Town Hall, Bradford	Oct. 1
Carmarthen—House, Longacre-road		G. Morgan and Sons, Architects, King-street, Carmarthen	" 1
Hull—Riding School	Urban District Council	A. Edward Thompson, Architect, Manor-street, Hull	" 1
Witbycombe Raleigh—Stables	Quick Estate Trustees	E. H. Harbottle and Son, Architects, County Chambers, Exeter	" 1
Barry—Central Public Library, Holton-road	Urban District Council	Hutchinson and Harding Payne, Architects, 11, John-street, W.C.	" 2
Newton St. Cyres—Pair of Cottages, East Woodley Farm	Admiralty	Ellis, Son, & Bowden, F.S.I., Surveyors, Bedford Chambers, Exeter	" 2
Great Crosby—Free Library, College-road	School Board	Anderson and Crawford, Architects, 36, Dale-street, Liverpool	" 2
St. Mary's, Isles of Scilly—Coastguard Buildings		The Supt. Civil Engineer, H.M. Dockyard, Devonport	" 2
Ballygarry—School Enlargement	Urban District Council	William Birrell, Architect, 200, High-street, Kirkcaldy	" 2
Risca—Three Houses	Corporation	Ernest N. Johnson, Architect, Risca, Mon.	" 3
Swadincote—Fire Station	Urban District Council	Thomas Kidd, Town Engineer, Swadincote	" 3
Bridlington—Parade Shelter	Watch Committee	E. R. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington	" 3
Goole—Public Library	Lady Lumley's Foundation Governors	H. B. Thorp, Architect, Aire-street, Goole	" 3
Ilanely—Public Hall at Cross Hands	Treveltham School Board	David Jenkins, F.R.I.B.A., Llandilo	" 3
Birmingham—Police Station, Bloomsbury-street		John Price, City Engineer, Council House, Birmingham	" 5
Pickering—Grammar School	Great Western Railway Co.	John Bilson, Architect, 23, Parliament-street, Hull	" 5
Portsey—Shops and Houses	Shoreditch Borough Council	R. B. Pratt, A.R.I.B.A., Town and County Bank Buildings, Elgin	" 5
Varteg, Pontypool—School (270 places)	London County Council	Landsdowne and Griggs, Architects, Newport, Mon.	" 5
Belfast—Incorporate Maternity Hospital	Great Western Railway Co.	W. J. Fennell, M.R.I.A.I., Architect, 2, Wellington-place, Belfast	" 5
Legacy, Ruabon—Cottage	Rural District Council	G. K. Mills, Secretary, Paddington Station, W.	" 6
Hooton-square, N.—Pulling Down and Rebuilding Stores	Hensworth R.D.C.	J. Rush Dixon, A.M.I.C.E., Town Hall, Old-street, E.C.	" 6
Stratford, E.—Repairing Abbey Mills Pumping Station	Borough Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Harrington—Vicarage	Campbell Gas-Engine Co.	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	" 6
Llandenny, Mon.—Cottage at Raglan-road Level Crossing	Admiralty	G. K. Mills, Secretary, Paddington Station, W.	" 6
Naas—Sixteen Labourers' Cottages	Rural District Council	D. J. Purcell, Clerk, Naas, Ireland	" 7
Sink Kirby—Lodge at Hospital	Henry A. Burke	J. Richardson, Architect, Hensworth	" 7
Fulham, S.W.—Two Lodges in South Park	Education Committee	Francis Wood, A.M.I.C.E., Engineer, Town Hall, Fulham, S.W.	" 7
Halifax—Extensions to Works		Jackson and Fox, Architects, 7, Rawson-street, Halifax	" 8
Walton Creek, Essex—Coastguard Station	Oscar Blackford	The Director of Works, 21, Northumberland-avenue, W.C.	" 9
Pontefract—Free Library, Salter-row	John T. Lack	Garside and Pennington, Architects, Pontefract	" 10
Downpatrick—Seven Labourers' Cottages	A. Maddison	Edward Nolan, C.E., Workhouse, Downpatrick	" 10
Ballinamallard—Business Premises	John T. Lack	T. Elliott, Architect, 37, Darling-street, Enniskillen	" 10
Letterkenny—Floors at Lunatic Asylum	United Building Society	J. P. McGrath, Architect, Poyle-street, Londonderry	" 13
Portsmouth—School		Rake and Cogswell, Architects, Prudential Buildings, Landport	" 23
Chipstead, Surrey—Residence and Outbuildings	F. Eastaugh	H. G. Gribble, Architect, Hill View, St. John's, near Woking	"
Branksome—Public Library, Lake-road		Samuel J. Newman, F.R.I.B.A., Branksome, Parkstone	"
Truro—Alterations to Premises		Silvanus Trevel, F.R.I.B.A., Truro	"
Shepherd's Bush, W.—Shops and Flats, Uxbridge-road		Palgrave and Co., Architects, 28, Victoria-street, Westminster	"
Leeds—Additions to House and Stables		Mossley and Co., Estate Agents, 6, Wormwood-row, Leeds	"
Clacton-on-Sea—Residence		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	"
Harrogate—Farmhouse at Pannal Ash		Bolshaw and Stevens, Architects, 1, Princes-street, Harrogate	"
Blackburn—House		Pegg and Farrow, Architects, 7, Market-place, Barnard Castle	"
Blackburn—Cottage Homes for Disabled Soldiers		M'Call and Robinson, Architects, 7, Tacketts-street, Blackburn	"
Purfect—Twenty Workmen's Cottages		V. Millett, 72, Bishopgate-street Within, E.C.	"
Clacton-on-Sea—Detached Residence		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	"
Uley—Stable, &c.		Moore and Crabtree, Architects, York Chambers, Keighley	"
Skircoat, Halifax—Two Villas		Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	"
Pwll—Mission Church		C. A. Jones, Cilymaenllwyd, Llanelli	"
Tredegar—Ten Houses		W. S. Williams, Architect, Tredegar, Mon.	"
Pontypool—Presbyterian Hall		Habershon, Fawcner, and Co., Archts., High-st., Newport, Mon.	"
Leeds—Wesleyan Sunday-School, Cardigan-lane		Danby and Simpson, Architects, 10, Park-row, Leeds	"
Southwold—Shop and Residence, High-street		Arthur Pells, F.S.I., Architect, Beccles	"

ELECTRICAL PLANT.

Rochdale—Underground Cables and Switchboard Alterations	Guardians	Shepherd and Watney, Greek-street Chambers, Leeds	Sept. 26
Launceston, Tasmania—Electric Meters (500)	Corporation	Wm. Corio, City Elec. Engineer, Launceston, Tasmania	" 29
Ashton-under-Lyne—Arc Lamp Carbons (One Year)	Market and Lighting Committee	Neville Applebee, Borough Electrical Engineer, Ashton-under-Lyne	" 29
Dundee—Relaying Mains	Town Council	H. Richardson, A.M.I.E.E., Dundee Crescent-road, Dundee	" 30
Manchester—Electricity Meters (1,200)	Electricity Committee	F. E. Hughes, Secretary, Town Hall, Manchester	Oct. 1
Dublin—Electric Crane (100-ton)	Port and Docks Board	John P. Griffith, M.I.C.E., East Wall, Dublin	" 5
Oldham—Electric Lighting	Corporation Electricity Committee	W. Newington, Engineer, Greenhill Electricity Works, Oldham	" 6
Birkenhead—Wiring Laird and Holt Schools of Art	Education Committee	William Bates, A.M.I.C.E., Craven-street, Birkenhead	" 9
Johannesburg—Plant	Municipal Council	Morley and Dawbarn, 82, Victoria-street, Westminster, S.W.	" 19
Blackpool—Arc Lamp Carbons (One Year)	Corporation	Charles Furness, Boro' Elec. Eng., Electricity Works, Blackpool	"

ENGINEERING.

Eccles—Cast-Iron Tank	Corporation	The Borough Electrical Engineer, Cawdor-street, Patricroft	Sept. 23
Eccles—Reconstructing Monton Bridge	Corporation	C. S. Allott and Son, 44, Brown-street, Manchester	" 26
Eccles—Centrifugal Pump	Corporation	The Borough Electrical Engineer, Cawdor-street, Patricroft	" 28
Burntisland—Timber Dolphin	Harbour Commissioners	R. Henderson, Civil Engineer, 5, High-street, Burntisland	" 28
Marlock—Water Supply Extension	Yeovil Rural District Council	Bailey-Denton and Partners, M.M.I.C.E., 9, Bridge-street, S.W.	" 28
Chorley—Steel Roof	Corporation	J. Mills, Town Clerk, Town Hall, Chorley	" 28
Blean—Repairing Pumping Engine, &c.	Guardians	J. E. Burch, Clerk, 39, Castle-street, Canterbury	" 28
India Office, S.W.—Boilers	Secretary of State for India	The Director-General of Stores, India Office, Whitehall, S.W.	" 29
Conway—Sewerage and Waterworks	Rural District Council	T. B. Farrington, A.M.I.C.E., Trinity-square, Llandudno	" 31
Llandaff—Pumping Station	Llandaff and Dinas Powis R.D.C.	J. Holden, Engineer, Llandaff Chambers, 35, St. Mary-st., Cardiff	" 31
Halifax—Heating Apparatus at Skircoat Depot	Tramways Committee	J. Lord, C.E., Borough Engineer, Town Hall, Halifax	" 31
Dundee—Relaying Mains	Town Council	H. Richardson, A.M.I.E.E., Dunhope-crescent-road, Dundee	" 31
Tregaron—Service Reservoir	Rural District Council	J. Davies and Sons, A.M.I.C.E., Llanelly	" 31
Angram, Bradford—Masonry Dam (1,200ft. by 130ft.)	Corporation	James Watson, Waterworks Engineer, Town Hall, Bradford	Oct. 1
Felixstowe—Concrete Sea Wall and Timber Groynes	Urban District Council	John Russell, M.I.C.E., 15, Victoria-street, Westminster	" 1
Bradford—Three Service Reservoirs	Corporation	James Watson, Waterworks Engineer, Town Hall, Bradford	" 1
Milford—Extension of Pipe Line of Waterworks	Rural District Council	J. M. Robinson, 7, East-wall, Londonderry	" 3
Nottingham—Pumping Engines	Water Committee	Stephen Moore, General Manager, St. Peter's-square, Nottingham	" 5
Bishop Auckland—Waterworks	Rural District Council	C. Johnston, Surveyor, Cradock-street, Bishop Auckland	" 5
Royal Victoria Dock, E.—Wharf	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 6
Greenwich, S.E.—Four 5,000 H.P. Steam-Engines	London County Council	The Clerk, County Hall, Spring Gardens, S.W.	" 6
Swindon—Reconstructing Cricklade-road Bridge	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 6
Vauxhall, S.W.—Steel Superstructure of New Bridge	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Swindon—Bridges over Canal	Corporation	Lacey and Sillar, Engineers, 78, King-street, Manchester	" 7
Hemsworth—Extension of Water Main	Rural District Council	T. H. Richardson, Engineer, Hemsworth	" 7
Winwick—Fire Main at County Asylum	Committee of Visitors	J. P. Muspratt, Clerk, County Offices, Preston	" 7
Gorton—Refuse Destructor	Urban District Council	C. J. Lomax, Alliance Buildings, 37, Cross-street, Manchester	" 7
Manchester—Laying Underground Telephone Pipes	Paving and Highways Committee	The City Surveyor's Office, Town Hall, Manchester	" 8
Swansea—Cofferdam at Basin Entrance	Harbour Trustees	A. O. Schenk, M.I.C.E., Harbour Offices, Swansea	" 8
Padstow—Widening Padstow Bridge	Lancashire County Council	The County Bridgmaster's Office, Preston	" 12
Latterkeny—Heating, &c., Lunatic Asylum	Dock Commissioners	J. P. McGrath, Architect, Foyle-street, Londonderry	" 13
Ipswich—Pilework to West-road Quay Wall	Tramways Committee	T. Miller, M.I.C.E., 9, Thoroughfare, Ipswich	" 15
Salford—Machinery	Urban District Council	The General Manager, 32, Blackfriars-street, Salford	" 14
Valletta, Malta—Lift Construction	Ministry of Public Works	The Receiver-General and Director of Contracts, Malta, Valletta	" 30
Kingsbridge—Waterworks	Corporation	T. W. Latham, Engineer, Kingsbridge	Nov. 2
Cairo—Three Road Bridges over the Nile	Ministry of Public Works	The C. Intel. Branch, Board of Trade, 50, Parliament-st., S.W. (1904)	Feb. 1
Stamford—Stone-Breaking Machine	Corporation	T. W. A. Hayward, A.M.I.C.E., Borough Surveyor, Stamford	"
Perth—Engine and Pumps	Town Council	A. Davidson, Water Engineer, Tay-street, Perth	"

FENCING AND WALLS.

Radcliffe—Stone Fence Walls, &c., at Cemetery	Urban District Council	W. L. Rothwell, Engineer, Radcliffe, Lancs	Sept. 26
Wigan—Boundary Walls at Cemetery	Rural Board	W. B. Johnson and Sons, Architects, 3, King-street, Wigan	" 26
Radcliffe—Iron Fencing and Gates at Cemetery	Urban District Council	W. L. Rothwell, Engineer, Radcliffe, Lancs	" 26
Cambridge—Retaining Wall next the River	Corporation	The Borough Surveyor, Guildhall, Cambridge	" 28
Swindon—Wrought-Iron Fencing at Whitefield Farm	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon	" 29
Wood Green, N.—Wrought-Iron Fencing (1,100 yards)	Urban District Council	C. J. Guynon, A.M.I.C.E., Town Hall, Wood Green, N.	" 30
Margate—Wrought-Iron Unclimbable Hurdles (275)	Town Council	Albert Latham, M.I.C.E., Engineer, 15, Cecil-square, Margate	Oct. 5
Salford—Brick Boundary Wall at Wallness	Lancashire & Yorkshire Railway Co.	The Borough Engineer, Town Hall, Salford	" 5
Manchester—Larch Fencing, &c.	Urban District Council	R. C. Irwin, Secretary, Hunt's Bank, Manchester	" 5
Leyton—Oak Fencing, &c.	Corporation	W. Dawson, M.I.C.E., Surveyor, Town Hall, Leyton	" 6
Leigh—Iron Fencing (800 yards)	Corporation	T. Bunter, Borough Surveyor, Leigh	" 7
Margate—Toeing Wall, Newgate Gapway	International Exhibition	Ernest A. Bore, C.E., Borough Surveyor, Town Hall, Margate	" 12
Cape Town—Fencing Sheds, Band Stands, Fountains, &c.		The Offices, Palmerston House, Old Broad-street, E.C.	"

FURNITURE AND FITTINGS.

Castlereagh—Bedsteads	Guardians	J. Hester, Acting Clerk, Castlereagh, Ireland	Sept. 24
Northampton—School Furniture	Education Committee	The Secretary, County Hall, Northampton	" 28
Ulverston—New Council Chambers and Offices, Queen-street		J. W. Grundy and Son, Architects, Central Buildings, Ulverston	Oct. 2

PAINTING.

Loughborough, Leics.—Cemetery	Joint Burial Committee	C. W. J. Toone, Clerk, Loughborough	Sept. 26
Braemar—Invercauld Arms Hotel	James Grafton and Co.	Jenkins and Marr, Architects, 16, Bridge-street, Aberdeen	" 26
Knaresborough—Twelve Houses at Scriven	School Board	W. Rhodes Nunn, Architect, 13, Market-street, Bingley	" 30
Ashton-under-Lyne—Isolation Hospitals at Workhouse	Urban District Council	G. H. Partington, Clerk, Stamford-street, Ashton-under-Lyne	" 30
Ballying—School	Urban District Council	Wm. Birrell, Architect, 200, High-street, Kirkcaldy	Oct. 2
Goole—Public Library	Corporation	H. P. Thorp, Architect, Aire-street, Goole	" 3
Bridlington—Parade Shelter	Corporation	E. R. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington	" 3
Harrington—Vicarage	London County Council	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	" 6
Stratford, E.—Abbey Mills Pumping Station	London County Council	The Engineer's Dept., County Hall, Spring Gardens, S.W.	" 6
Pontefract—Free Library, Salter-row	Consett Iron Co., Ltd.	Garside and Pennington, Architects, Pontefract	" 10
Consett—Steel Melting Shops and Rolling Mills		The Engineer, Company's Office, Consett	"

PLUMBING AND GLAZING.

Halifax—Silversmith's Works	Charles Horner	Walsh and Nicholas, Architects, Museum Chambers, Halifax	Sept. 29
Whitehaven—Six Houses, Wellington-row		J. S. Moffat, M.S.A., 53, Church-street, Whitehaven	" 29

ROADS AND STREETS.

South Bank—Road-making	North-Eastern Dwellings Co.	Moore and Archibald, Architects, 27, Albert-road, Middlesbrough	Sept. 26
Treharris—New Roads	Corporation	William Dowdeswell, Architect, Treharris	" 26
Wallsend—Street Works	Highways Committee	George Hollings, Borough Surveyor, Corporation Offices, Wallsend	" 28
Eastbourne—Private Improvement Works	Urban District Council	Daniel J. Bowe, Borough Surveyor, Town Hall, Eastbourne	" 28
Sheringham—Street Works	Improvement Committee	T. Inglis Goldie, A.R.I.B.A., Surveyor, Church-street, Sheringham	" 28
Halifax—Improvement Works	Urban District Council	James Lord, C.E., Borough Engineer, Town Hall, Halifax	" 28
Walthamstow—Street Works	Corporation	G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow	" 29
Swansea—Terrace Works	Corporation	O. Bell, Borough Surveyor, 13, Somerset-place, Swansea	" 29
Tynemouth—Road Works	Urban District Council	J. F. Smillie, Borough Surveyor, Tynemouth	" 29
Ilfracombe—Excavating and Filling Embanked Roads	Highway Committee	The Engineer's Office, Town Hall, Ilfracombe	" 30
Macclesfield—Street Works	Urban District Council	The Borough Engineer's Office, Macclesfield	" 30
Exmouth—Making-up Park-road	Improvement Committee	Samuel Hutton, Surveyor, Exmouth	" 30
Salford—Widening Roads	Urban District Council	L. C. Evans, Town Clerk, Town Hall, Salford	Oct. 1
Uttoxeter—Making-up Road	Urban District Council	R. W. Marshall, Surveyor, Town Hall, Uttoxeter	" 1
Norhampton—Flagging	Corporation	C. B. L. Fernandes, Clerk, Council Offices, Norhampton	" 1
Hull—Street Works	Corporation	A. E. White, M.I.C.E., City Engineer, Town Hall, Hull	" 2
Berwick-on-Tweed—Kerb, &c.	Urban District Council	The Borough Surveyor's Office, Wallace Green, Berwick	" 3
Camberley, Surrey—Road Works	Rural District Council	F. C. Uren, Surveyor, High-street, Camberley	" 5
Runcorn—Street Works	Corporation	J. Swinton, Surveyor, Stockton Heath, near Warrington	" 5
Walsall—Completing Borneo-street	Urban District Council	The Borough Surveyor, Bridge-street, Walsall	" 6
Aspull—Private Street Works	District Council	Heaton, Ralph, and Heaton, Surveyors, Wigan	" 6
Nantymoel and Blaengarw—Street Works	Ogmore and Garw U.D.C.	H. Dawkin Williams, Surveyor, Blackmill, near Bridgend	" 12
Lavenham—Kerbing Water-street and High-street	Cosford Rural District Council	Ernest W. Veale, C.E., Surveyor, Bildeston	"

SANITARY.

Lichfield—Converting Privies	Gas Co.	The Gas Office, Queen-street, Lichfield	Sept. 26
Wigan—Surface Drains, &c., at Cemetery	Rural Board	W. B. Johnson and Sons, Architects, 31, King-street, Wigan	" 26
Ashby-de-la-Zouch—Sewers	Rural District Council	S. Turner, Surveyor, Avenue-road, Ashby-de-la-Zouch	" 26
Ripley, Surrey—Sewerage Works	Guildford Rural District Council	John Anstee, C.E., Commercial-road, Guildford	" 28
Clifton—Sewers at Lunatic Asylum	Visiting Committee	Fairbank and Son, C.E., Lendal Chambers, York	" 28
Alwicks—Sewerage Works	Rural District Council	H. W. Walton, Clerk, Alwicks	" 28
Pittenweem—Addition to Sewerage System	Town Council	A. C. Mackintosh, Town Clerk, Pittenweem	" 28
Wombwell—Drainage Works	Urban District Council	John Robinson, Clerk, Town Hall, Wombwell	" 28
Buntingford—Drainage Works at Workhouse	Guardians	E. G. Thody, Surveyor, High-street, Buntingford, Herts	" 29
Dinas Powis—Sewers	Rural District Council	James Holden, A.M.I.C.E., 35, St. Mary-street, Cardiff	" 30
Formby—Sewerage Works	West Lancashire R.D.C.	C. A. Atkinson, Engineer, 11, Tithebarn-street, Liverpool	" 30
Dorchester Sanitary Works at Hospital	Management Committee	Walter J. Fletcher, A.M.I.C.E., Dorchester	" 30
Eastbrook—Sewers	Rural District Council	James Holden, A.M.I.C.E., 35, St. Mary-street, Cardiff	" 30
Brixton, Devon—Drainage Works	Plymouth St. Mary R.D.C.	Fred. Wm. Cleverton, Clerk, 4, Buckland-terrace, Plymouth	Oct. 1
St. Budeaux—Sewers	Plymouth St. Mary R.D.C.	F. A. Clerk, Surveyor, 83, Old Town-street, Plymouth	" 1
Featherstone, Yorks—Sewerage Works	Urban District Council	Fredk. B. Rothera, C.S.I., Engineer, Featherstone, Yorks	" 5
Leeds—Sewerage Works	Rural District Council	Spinks and Pilling, Engineers, 20, Park-row, Leeds	" 5
St. Martin's-le-Grand, E.C.—Underground Convenience	City Corporation	The Engineer, Public Health Department, Guildhall, E.C.	" 6
London, E.C.—Underground Convenience, Falcon-square	City Corporation	The Engineer, Public Health Department, Guildhall, E.C.	" 7
Canklow—Sewers, &c.	Rotherham Rural District Council	B. Hey, Surveyor, 29a, High-street, Rotherham	" 8
Cheadle, Staffs—Sewer	Rural District Council	F. S. Cox, Clerk, Cheadle, Stoke-on-Trent	" 12
Hastings—Sewer	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	" 12
Ilford—Sewerage Works Extension	Urban District Council	H. Shaw, A.M.I.C.E., Town Hall, Ilford	" 13

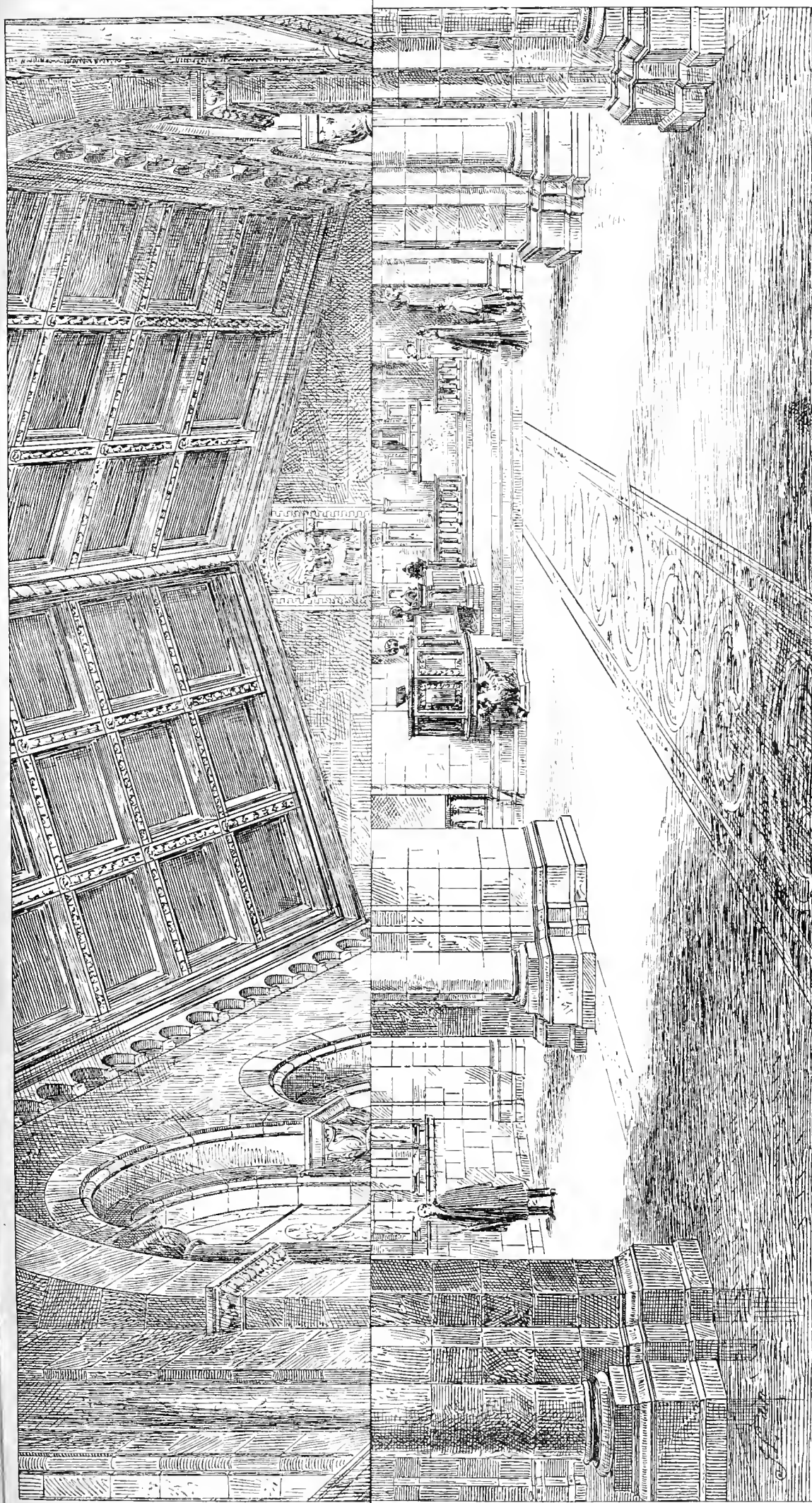
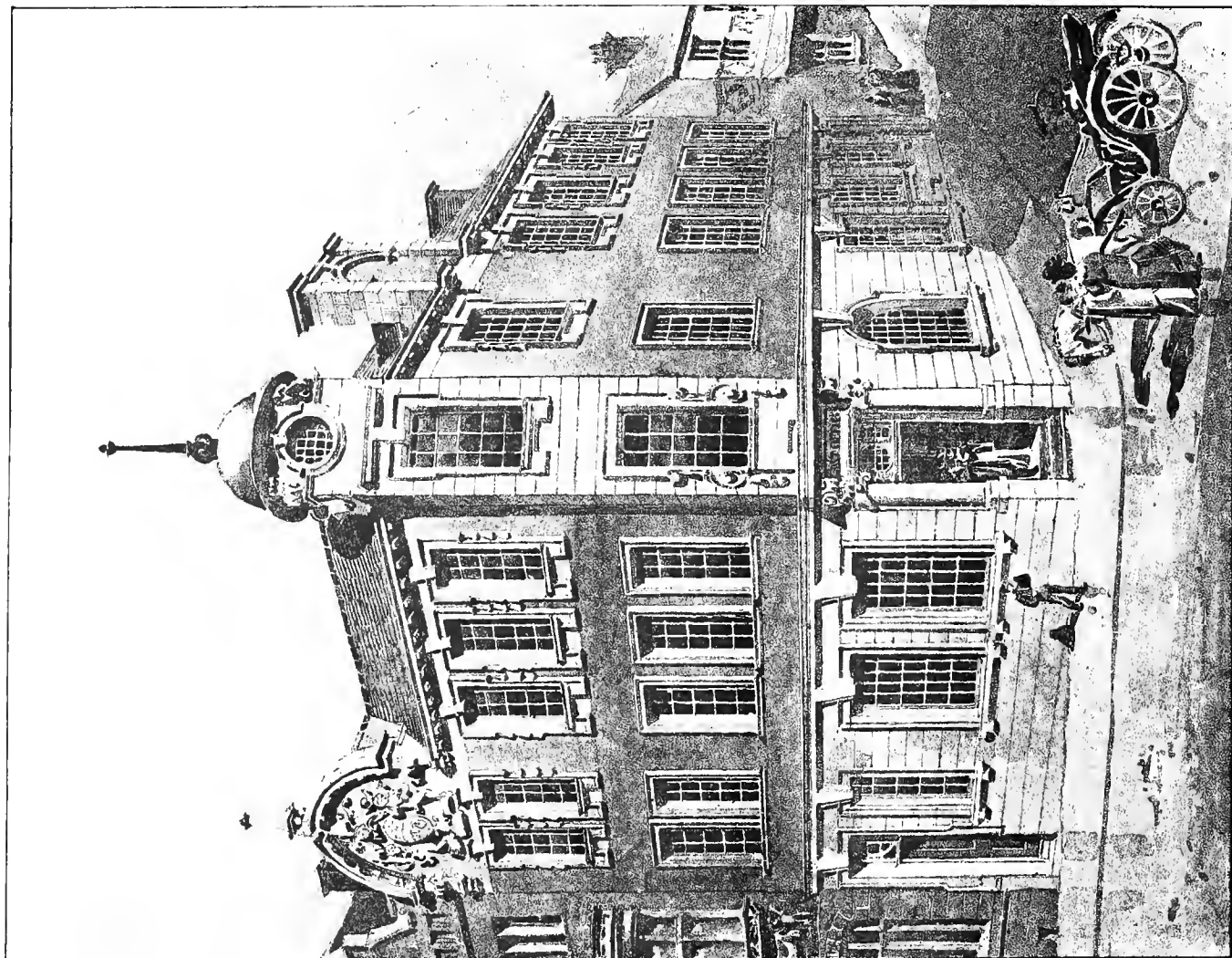
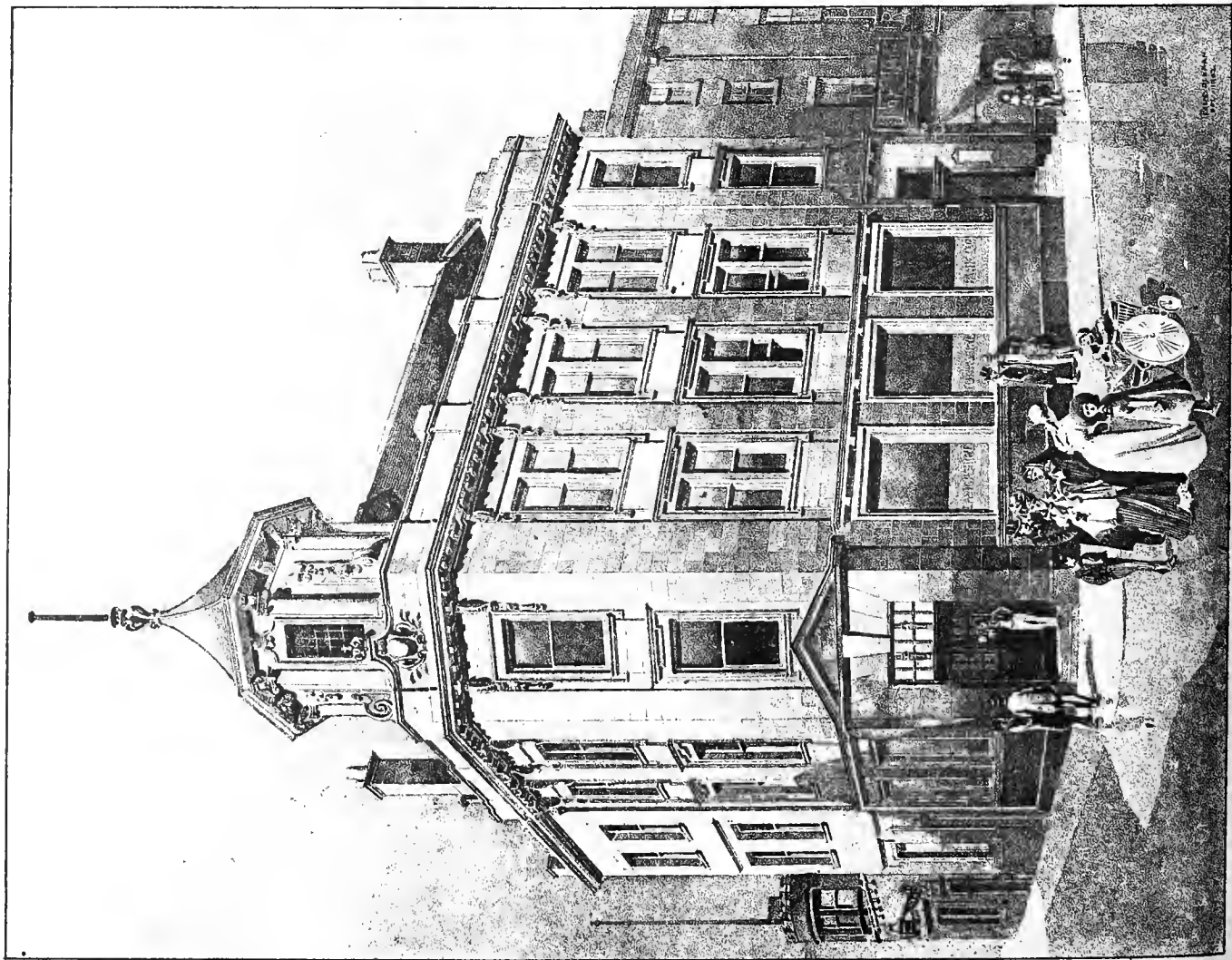


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A PROPOSED TOWN CHURCH IN THE 'MIDLANDS
WALTER ASTON ARCHT



THE BUILDING NEWS, SEPT 25, 1903.





COURT

FAWSIDE, CURRIEMUIREND, COLINTON

EDWARD C. H. MAIDMAN
ARCHITECT EDINBURGH

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STANDARD PLANS.

PROBABLY there is a type to be found for every class of building, if only the architect knew where to look for it. As a matter of fact, he is often at a loss to know where to find a structure that will give him an idea that will suit his purpose; for, after all, it is the idea that the designer wants in the planning and design of any building. A man may be a thorough artist, a skilful designer; but if he be without an idea to work upon, a great deal of his ability may be thrown away. A good stock of ideas, of mental plans and arrangements or treatments of design is of the utmost value to the architect; but how very few in the profession appear to possess this gift! The average practitioner, absorbed with all sorts of business details and duties, has very little opportunity. When he has a building to design that is a little out of the common, he naturally turns to his volumes of the BUILDING NEWS or other professional journal, to his portfolios, or to works that have been executed by other members of the profession, and if he is at all skilful in adaptation he may be able to do something with them; but he may just miss the right motive or principle of design. If he could at once hit on the right motive or idea of plan, an immense amount of laborious thought and effort, pencilling and erasing would be saved. All that he can do in ordinary circumstances is to take up the problem where others have left it, trusting to his own invention and skill to produce a building that will serve its object. It is this difficulty which is felt by all who enter the profession of architecture. The majority of men are without the gift of invention: they can take up the subject just where their immediate predecessors have left it, without trying to make any effort to discover a better scheme or principle. A new public library is contemplated, or there is a competition for one. The average practitioner is contented to find out a library recently built, and to base his plans upon it, without ascertaining primarily what the actual requirements are of a public free library and its mode of working and organisation, and endeavouring to meet these in the most direct manner he can. In this way he would probably be led to a more economical and simple plan than by following the arrangement of a building that may not be perfect even for its particular site. Any faults it had he may perhaps repeat, and in a worse form. But this is the ordinary mode of proceeding. He does not pursue his inquiry into the origin and functions of the building, but takes an example of an executed structure that may be defective. In designing a public school, the architect often overlooks an ideal plan which would considerably simplify his design for the sake of following one that has been built for a different site, and it is the same with the planning of a large hospital for special cases: a typical arrangement may be found out by investigation and study; but, instead, the architect adopts the general scheme of some executed hospital without inquiry. Town halls and municipal offices now exist in numerous cities, and it ought not to be difficult to find out good types of plan to follow. The shape of the site and various other things, like light and levels of ground, have to be considered; but the leading principles of locating the departments, of communication between the offices, lighting, &c., should be clear to the mind before

the design is carried out. A type of plan does not necessarily refer solely to the ensemble or grouping of the building, but to the internal connection of the parts, the principle of disposing the offices of town clerk, of town surveyor, the accountants' and rates department, sanitary and medical offices, the town council chamber and its various subsidiary rooms, and if there is a large assembly hall the position for it that will fulfil the requirements of the L.C.C. or local regulations as to entrances and exits, lighting, &c. Above all, it is necessary to have a correct idea of the requirements of the public, and the easiest and direct routes to such departments as the rate-collector's offices, the sanitary offices, the magistrates' courts, the town hall, &c., so that the routes or corridors may not overlap other departments or cause confusion and inconvenience to the regular officials engaged in other offices. This principle of economy of plan is very often neglected in designs for buildings of this class. The most frequented public offices ought to be planned with as short and direct routes from separate entrances as possible. Again, there are some good types for technical schools and laboratories and public baths which ought to form a staple subject in every architect's education; but these are not generally available. The best designs for buildings of this description are by men who are not inclined to publish their work, and are not communicative about the results achieved or the principle they have made their own; so the ordinary architect has to be contented with buildings of less repute. When we consider that experience of a special kind is dearly bought, we are not surprised that the best public buildings are only accessible to those who can visit them and make their own personal observations. The organised visits to buildings in progress or finished, made by the Architectural Association and other societies, enable members of these bodies to learn something of their plan and design, which is of great value to students. The published plans of buildings of particular kinds, such as those we give, are also of great value, if they are studied in a proper manner without exclusive reference to their accidental and external character. They ought to be studied, not copied; and the way to study them is not to be satisfied with looking at the plan and finding out its good points, but to discover how they comply with the requirements—to do which the problem must be thought over first, and the conditions of the site and building mastered. Unless the problem is mentally present, the examination of a building or a plan can have little value except in exhibiting the skill and craftsmanship of the designer in the details of the plan. The mental effort to see what is required and to express it in form is very seldom attained, and it is this which constitutes the idea. The standard building is more or less an expression of such an idea; but there are few of them, and it is only the skilled architect that can discern one when he sees it. The majority are content to follow second-hand, and to take ordinary buildings as their guides. But, as we have said, men with ideas are rare, while there are an abundance of people who take their knowledge second and third-hand, and who design buildings in the same way. They do not care for advances. The plan of a hospital or a set of baths which was tolerable many years ago is sufficient for them; clients and committees also put their trust in them;—they would rather accept a design which shows a disposition of wards or baths they are accustomed to see, than a new plan based on the most recent science. They are not cognisant of the most advanced practice, so the general movement in architecture, as in other things, is along a moderate line—a *via media*. For this reason new ideas find slow acceptance with the public, and the men with advanced views of

arrangement or construction are often not so fortunate as their less accomplished brethren. There are standard plans for most structures: we mean those which have been designed by experts and leading architects. The development of specialism has led to this. Thus there are many leading firms who have designed and erected university, elementary, and technical schools; who have obtained a name for their asylums and hospitals, and for baths and washhouses, and town-halls. It would be invidious to notice the names—they are well known as experts in these several branches of work. These works are accessible, and many of the designs and plans have been published. Even in housing for the labouring classes we can refer to a few men who have done good service, others who are successful house-builders, others who have made a reputation for their designs for churches. We say it would not be difficult to pick out typical plans of buildings in all the above classes—plans which are types of good arrangement and economy, and which have been found to work well. We do not mean that these typical plans should be copied in any sense, but merely be accepted as fairly good models of buildings in different circumstances. Thus, for instance, the Manchester Town Hall might be taken as a typical example of a good plan for the particular site. Those of Liverpool, Leeds, Bradford, Glasgow, and Belfast may be regarded as types of more monumental buildings. The Municipal Offices of Sheffield may be taken as a good example of planning for a triangular or trapezoidal site. And in all the best plans we find these main characteristics: (a) the grouping of departments, (b) facility of access to each from the street, (c) intercommunication between the separate offices, (d) in lighting of rooms and corridors. The premiated designs for the Hull Town Hall extension show also some good planning, which deserves notice. For smaller buildings on rectangular sites, such a design as that selected for Tottenham may be taken as a good model; but there are many other buildings which contain the germs of desirable arrangement.

In hospital design many types are to be found as in those we have illustrated, built by the Metropolitan Asylums Board, as those at Hither Green and Tooting for fever cases. The recent competition plans for a Royal Sanatorium for Tuberculosis and the Frimley Sanatorium, Surrey, in connection with the Brompton Consumption Hospital, for single and double beds, with corridors, arranged as radial pavilions of two stories from a centre building where special cases are under close inspection, are plans based on the latest experience. In such designs every patient's room is made to face South, S.S.E., or S.S.W. The Manchester and Salford Skin Hospital designs afford also good models for study. The new Belgrave Hospital for Children, Kennington, has a good plan of pavilions placed with axes at right angles to each other. Each ward is disconnected from the main building by means of a lobby or bridge. Any doubtful case is isolated. A good type of ward for special cases of treatment is the main feature to notice; and, in the second place, the principle of disposing the separate pavilions on the ground, so as to insure ample sunlight and air. The special rules drawn up by the management of the particular hospital will, of course, be the best guide to the architect. Copying in a case of this sort would be suicidal. We can imagine an architect taking the general scheme of a hospital with radial or other distribution of blocks, and applying it to another site having a different position as regards aspect. The idea would be simply absurd; but he can examine the principle of its design—the way the ward windows face, the direction of the separate pavilions, and the plan of each ward. He must study the design analytically, so as to discover its

principle before he thinks of adapting any portion to another site. There has been a great deal of indiscriminate copying of buildings, in which often the least useful or desirable parts are copied, while the real solution of the problem is left out. In the design of technical schools there are several standard plans which are available. These schools have been and are being erected all over the kingdom, good, bad, and indifferent. It is for the architect to find out the requirements—the size and position of classrooms, lecture-rooms, laboratories, and their fittings—before he is able to compose a plan suitable for any position. With this object the standard plan will afford him a guide. He may take for example the Manchester Municipal School of Technology as a good school constructed on modern principles of arrangement, and there are many technological schools in London as that at Finsbury. The municipal school at Manchester is a fairly good model to study. The plan is an oblong, with inner corridors on each of the six floors, giving access to the various classrooms and laboratories. The corridors are lit by two spacious areas, while the rooms are lighted externally. Above the entrance-hall, which is of large area, is an examination and public lecture-hall, of about 4,000ft. area; and above this a chemical laboratory. The basement is one great workshop and laboratory for spinning and weaving, mechanical, electrical, steam, and hydraulic engineering. Laboratories and workshops are provided for chemical, physical, metallurgical, sanitary investigations, &c. A good type of laboratory can only be developed by experience in the teaching of pupils, by a study of the requirements, the working at benches, and other apparatus. There are certain dimensions for rooms, bench space, area per pupil, &c., which must be complied with before the shape and size of a laboratory can be determined. In all these structures it is the actual working that must be understood before a design can be made; and it is the fulfilment of those conditions that we look for in the best plans. The practical wants of the occupants must be understood before it is possible to gain an idea of a building. By a standard plan we mean a practical realisation or embodiment of the functions or necessities of the work or business done in a building. Very few structures can be found to fulfil these conditions: the majority are erected by men who do not grasp the work or official duties carried on; the building is a misfit, if it is a factory, the mechanical plant does not fit; if a tradesman's establishment, the interior has to be remodelled; if a public office, every official complains of dark corridors, offices that are difficult of access and uncomfortable. In these days of complex requirements and industries, it is almost impossible to rely entirely on an idea, however good it may be. So the architect must be governed partly by what he has done before, and by his client's wishes. One writer, speaking of standard plans, says, of course he must not copy; it may be that it does not answer sufficiently well the particular wishes of the client. "What is necessary is that the architect, although inspired by the standard plan in its essential lines, should follow the general ideas of his client, and add to the work ideas of his own." The unaided mind requires a guide and direction, and such a good design affords the designer. But he must not copy, however closely the design appears to suit him, and it is this power of being inspired by a standard plan without necessarily following it, and of incorporating with it one's own power of individuality and adaptation, that makes the artist. But it is not everyone who has the insight to select what is good or the most suitable for his purpose. By many, a standard plan is not so easily found. This is why we see so many good copies of bad designs—buildings

in which the architect has taken the greatest pains about the elevation, the sculpture and ornament, but quite missed the opportunity; or the building is an *alla pavida* of various features taken from other buildings. So the worst plans and details may be reproduced. Thus it is that the best buildings are not seen or appreciated by everybody, and they can be only valued by those who have the knowledge of the requirements. There is no royal road to a knowledge of standard plans; the gifted artist with a brilliant idea may be able to solve the problem of design after a slight acquaintance with the work. The illustrious architects of the past were confronted with buildings of single aim and simplicity, as in the temple or the Mediaeval church, or the conventual building, which they could at once grasp; but now the multiplied wants of highly civilised communities living in great towns have rendered it impossible, without considerable knowledge, for the architect to evolve out of his own mind a scheme or plan suitable to any particular want, or to become acquainted with types of building which can be accepted as models.

COURSES FOR STUDENTS.

THE approaching session of the architectural schools and societies which we have entered upon promises to be active upon questions of education and policy. The establishment of a day school by the Architectural Association, which commenced a year or two ago, has been found of great help to the younger members of the profession, and has realised the expectations of the committee. Before entering an office the need of an elementary training in various subjects has been long felt; but there were few opportunities open to the student. The day and evening classes of the Association now afford the pupil the means of studying branches of his vocation which cannot possibly be learned during his term of articles. A year or two spent in the day or evening school will enable him to acquire at a moderate cost those principles which lie at the root of his office training. As a preliminary course we can heartily recommend these opportunities of study. As the committee say in their report, a short time spent in such a school will enable the student to test his aptitude for the profession; it will also be a strong recommendation to architects who wish to obtain pupils that are well grounded in the elements of their work. Every facility is offered by the Association. If an article pupil is unable to attend the day-school every day, he can, with his master's consent, join the classes on at least two days of the week, and attend the evening lectures. The curriculum given in the Brown Book includes such elementary matters for the first year's course as the use of instruments and scales, freehand drawing, elementary perspective, the orders of Classic architecture, and the elements of styles and construction: just those subjects which beginners ought to know something about before they enter an office. The use of instruments, for example, is one of the first things to be learned. We have known pupils waste much of their time in making and reading scales, owing to their ignorance of the simplest method of making them. Quite as important is the necessity of a good drilling in the "Five Orders," which will enable a student to properly apportion his columns and entablature and their chief subdivisions, so that he may avoid mistakes in rendering properly the rough sketches of his master. A knowledge of the elements of construction, such as the proper joints to be shown in timber roofs and partitions, the mode of showing timber plates, joists, &c., the jointing of masonry, brick bond, &c., are absolutely essential in the drawing of the most ordinary section of a building. The lectures on this subject given

in the A.A. elementary course comprise foundations, brickwork, and masonry for the first term, outline of timber and metal construction for the second term, and roof coverings, plumbing, plastering, and joinery in the third term. The history of architecture is also divided into three terms, and comprises thirty-six lectures on the leading developments and styles which are given in the Brown Book, to which we refer the reader. It will thus be seen that the work of the school is divided into a history and a construction side, and these are conducted through the agencies of lectures and studio work, the latter being mainly directed to making the student a good geometrical draughtsman. We refer to the subject now, because the annual course begins in this month (October), which is the most convenient time to enter. The second year's course may be followed during the first year of the pupil's articles, and is so arranged as to afford the student systematic teaching supplementary to his practical office work. This concurrent use of the day-school and office routine will be found of great service in simultaneously instructing the pupil in both sides of his work—the practical and theoretical.

We believe in this combination of the two methods of instruction. For instance, during the second year's course, elementary construction will supplement the pupil's office work, and better fit him to prepare the sections and details he may have to draw in the office. During the second year's course (the first year of the articles) simple subjects in design should be given illustrating the styles previously learned in the lectures. These designs should illustrate the methods of the styles, and in this way furnish the student with a practical side to the lecture course. The geometrical drawing studies should also be given simultaneously or following the course of the lectures. The studies should, in fact, explain them. In the Association day school this order is followed; thus the drawing of the Five Orders accompanies the lectures on Greek and Roman architecture. A small scale plan of a large Roman edifice is also given as an exercise, during this part of the course. Romanesque and Gothic developments of the vaulted roof worked out in plan and section accompany these lectures, thus giving the student an interesting demonstration of these important types of construction and style found in the Roman Basilica, on which so much depends. So in a later term the student is given an example of a vault or two bays of a Gothic church, which he has to draw in plan, section, and elevation, or a traceried window of a certain period is required, so that the student is simultaneously engaged in drawing out a typical example; thus the lecture is illustrated in every case. It is important also that the lectures on construction should be illustrated by a drawn example. For this reason a small building, say a cottage, is given, drawn out to an inch scale, with details and specifications, and the lecturers explain the construction and mode of procedure. In such a matter as vaulting, a series of lectures, illustrated by diagram, will give the young student very little insight into the problem; but if the student has to draw the vault geometrically as well as he can with proper aid, the subject becomes of intelligent interest to him.

The history and the construction drawing work, if carried on in parallel lines, afford the student just that relief from the dull monotony of the classes or the studio which is so helpful. Each period or style is learned or engrafted on the mind of the student, as his attention is aroused by the drawing of an actual example. The second year's course at the Association includes principles of architectural design and perspective and sciography—two important subjects.

One of the faults of architectural training

is the tendency which pupils show of copying from the flat. The flat copy is placed before them, and in the ordinary schools it is inculcated. Drawings of buildings in the flat, elevations plain or shaded, are copied without restraint till the student gets into the habit of studying design simply from these means of representation without attempting to realise the solid form of buildings. One of the best methods of counteracting this habit is to instruct the student in modelling. The practice of "thinking in the solid," or in three dimensions, is of the utmost advantage in teaching design, to prevent the designer getting flat, and to instruct him in the power of perspective effect, of return sides, of recessed parts and sculptural detail. How is it possible by means of geometrical drawings, front and side views, say of a perch or a centre, or a tower, to adequately realise the executed effect? A perspective may help us to do so to a certain extent, and this is its value as a subject; but it does not impart to the student the power of adapting and adjusting the front and sides such as those of porches, gables, pediments, towers, roofs, and other features, and to mould his masses to the best advantage. In the Continental schools of architecture, as well as in those of the United States, the subject of modelling occupies an important place in the curriculum.

The first two years of the young student's training, including the commencement of his pupilage, are of the utmost value, for it is during this period the student begins to feel his aptitude and to discover his resources for his vocation; therefore, it is necessary during this time to lay the foundations of his future career. Instruction in design that will enable him to give form and character to his buildings, to apply the features and details of the best periods to his work, following the historic development of art is of importance. To teach design in its application to simple and everyday buildings ought to be the main endeavour of the masters. In London there are many opportunities and advantages for such a supplementary aid to the art-learned pupil: he has lectures, studios, classrooms, workshops, museums, libraries, visits to buildings in progress open to him if he cares to avail himself of their opportunities. But the pupil in London, if he does not bring himself into touch with these facilities, is really worse off in some things than the pupil in the country office, who has at least more opportunities for visiting buildings in progress and the workshops of building firms, and who is often more benefited by his master and his colleagues. The master often takes greater interest in his pupil's advancement than is the wont of the London firm, where things are managed more in narrow grooves. In a large drawing-office, for instance, of a London firm, the young pupil is kept to very mechanical and routine work for a considerable time; and if he does not attend classes or evening or day schools, he comes out of his office very little better than a mechanical draughtsman, with very limited ideas of construction, materials, and methods of work. In the North, the Leeds and Yorkshire Architectural Society have been endeavouring to supply the younger men who are members of their society with school of architecture. We are told by the *Yorkshire Post* that this society has been engaged in founding an approximation to a school in which students may fit themselves for the profession, and prepare for the Preliminary, Intermediate, and Final examinations of the Institute. Owing to lack of finances, the promoters cannot endow chairs of architecture as done in Manchester and Liverpool, so the Yorkshire society has had recourse to the expedient of utilising existing classes at the Yorkshire College and the Leeds Institute in conjunction with classes that are to be specially organised at the in-

stitute and the society's headquarters, to cover the whole course of architectural study." Indeed, until lately, there were no facilities for organised study offered to the architectural student; but how many other parts of the country are similarly situated? These are additional reasons why the legal registration of the profession is a question of immediate concern to it. In the mean time what the Yorkshire Society has done to organise classes to cover the whole of study, may very well be followed by other architectural societies. The pupil may very well learn much of practical construction in the classes of colleges where engineering subjects are taught, while in the subjects of design and history special courses could be given at other institutes. Classes can be established as the Yorkshire Society has done, for the subjects set in the R.I.B.A. examinations, so as to cover the whole field necessary for the student. The syllabus should be of a thoroughly practical kind. Historical examples and modern building problems should be learned on principles of design, and these should be given in parallel courses. But in every case the student should be left quite free to work out his own ideas; that no definite direction be imposed upon him in matters of taste, so that he may fully develop his own individuality.

A DEPARTMENTAL REPORT ON HIGHWAYS.

THE report of the departmental committee appointed by the President of the Local Government Board to inquire into the subject of highway authorities and administration in England and Wales has been issued this week. The committee, as appointed on March 18 last, with Mr. Grant Lawson, M.P., as a chairman, was directed to inquire into the general condition and sufficiency of the roads in England and Wales, and to report whether any, and if so, what, amendment of the law relating to these matters or its administration is desirable in view of the various purposes for which the roads now are or shortly may be utilised; and particularly whether any change of the authorities who have control over the roads or of their powers is required. The committee deal with the defects of the present system, and recommend that many of the smaller district councils should cease to exist as highway authorities, and that their duties in this regard should be taken over for the sake of economy by the county councils. In the case of the more important roads, at any rate, local sentiment should not be allowed to prevail. Instances are given of friction between different highway authorities, and the committee consider that this friction would be removed, and greater uniformity, economy, and efficiency secured, if it were possible to place the maintenance and improvement of all the principal roads in a county under the direct control of a County Highway Board, representative of all the authorities having at present rights and powers with regard to main roads. The committee consider the system of County Highway Boards as ideally the best possible under the existing conditions of Local Government in England and Wales, but they admit that its adoption would involve the solution of some intricate problems with regard to proportion of representation upon the boards, and to finance. They recommend some fourteen amendments of the present system, which they think would meet with very general approval. Some of these amendments would be rendered unnecessary if the system of County Highway Boards were adopted, but if that is found to be impossible, the committee recommend that they shall all be made. The amendments referred to are concerned for the most part with details of the administrative changes that would be necessary under the scheme, especially the making of agreements between the county highway boards and existing authorities for the maintenance of main roads and other highways. The consolidation of highway law is recommended. County councils have in some highway matters actually smaller powers than other highway authorities, and it is urged that this should be remedied. There are, however, some roads which the committee regard as entitled to be regarded as national roads, as distinguished from the county roads of

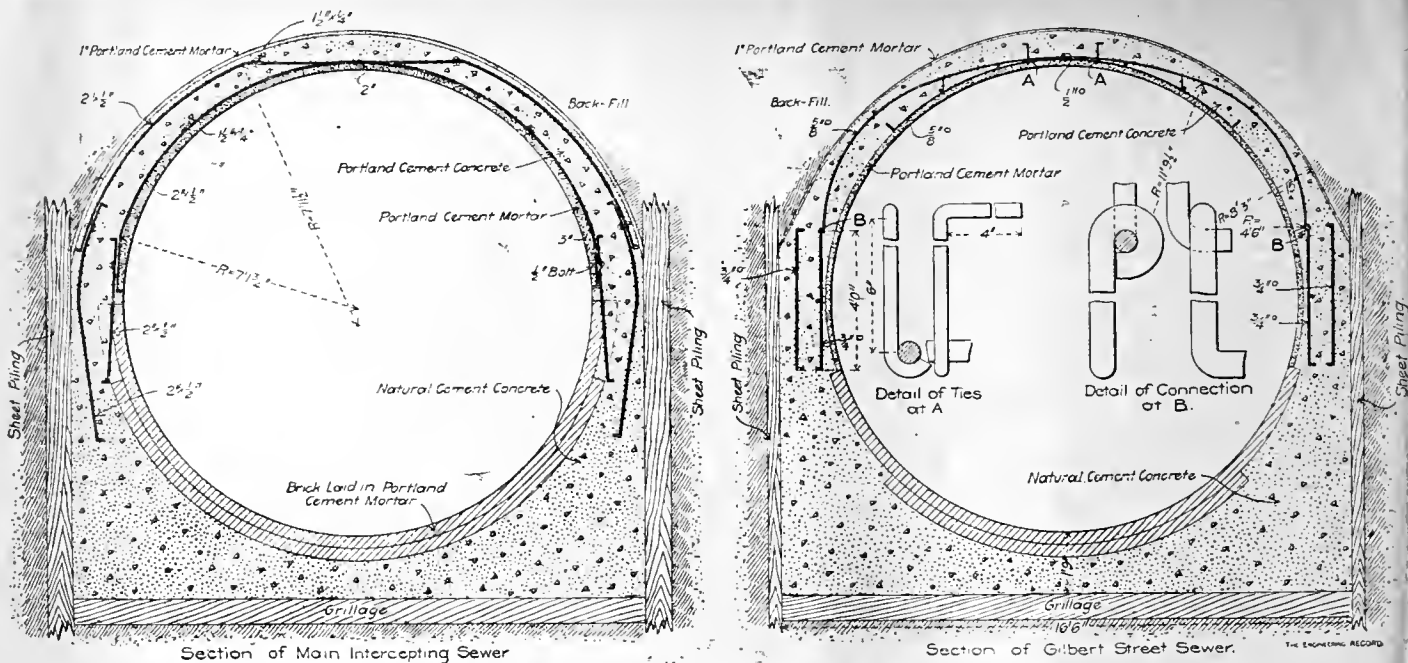
the county highway boards. On these "long distance through traffic, as compared with traffic which is local to the district or even to the county, will become of more importance every year with the development of new forms of traction. The cost of maintenance of trunk roads for such traffic appears to be a matter for national rather than for local or county provision. The selection of the roads which should be regarded as forming part of such trunk roads, and should be specially subsidised by the State, might well be left to the authoritative body suggested by the Royal Commission."

The report contains many observations and recommendations on such matters as the sufficiency of roads, widening, alternative routes, tramways and light railways, road openings, damage by traction engines, roadside wastes, and records.

CARPENTRY AND WOODWORK.

VOLUMES IV., V., and VI. of "The Modern Carpenter, Joiner, and Cabinetmaker," published by the Gresham Publishing Company, have now been issued under the editorship of Mr. G. Lister Sutcliffe, A.R.I.B.A., architect, and, like the previous parts, to which we have already directed attention, are copiously illustrated by diagrams. Volume IV. is devoted to the strength of timber and timber framing. The editor contributes a useful essay, under section 7, on Carpentry, detailing joints in tension, tension-compression, and transverse stress, with particulars as to scarfing and lengthening timber. Built-up and trussed beams are likewise dealt with, sketches showing the special points described. The same section is continued in Vol. V., following up the more individual items of carpentry with general plans of roofings, from the ordinary square, pyramidal, or hipped roof to complex and irregular roofings as contrived over buildings which occupy awkward sites. Spires, too, are included in the treatise, with turrets, steeples, as well as the shaped octagonals. Domes naturally are associated with this part of carpentry, and the author shows how to plan, set out, and construct spherical and ellipsoidal domes, vaults, and pendentives. Laminated roof constructions find a place for cheap sheds in big spans. There are among historical and ornate examples some sheets of Hampton Court Great Hall and of Westminster Hall. These plates, however, have a very old-fashioned look with their fine lines and machine-ruled hatching. The last volume has just come to hand, and in it Mr. Sutcliffe deals with floors and beams, including projecting galleries. The plate of Birchcliffe Chapel Gallery shows how steel bearers may be worked in combination with transverse joists stepped in stagings for seatings. Ceilings and soffits and groins come next, and then trussed partitions with openings in a variety of positions. The subject is elaborated in connection with framed buildings and colonial wooden erections, and also American houses. Half-timber work, too, from a carpenter's standpoint is described. The timber porch from South Hayling Church is a capital example of its kind, and makes one of the best drawings in the volume, recalling a sheet of sketches given in the *Building News* by Mr. Maurice B. Adams, many years ago, of the same subject. The plates of timber bridges have the appearance of being reproduced from some previous publication, and seem familiar, though perhaps none the less useful.

Mr. Harry Hems contributes a chapter on wood-carving, written in his customary graphically descriptive style. He ventures the admission that there is not a more conceited set of men than figure carvers, and illustrates this opinion by printing a sketch of a carver at work in the year of grace, 1452, reproduced, he believes, from an old illumination. He comes to the conclusion that egotistic chisellers are not entirely the creation of the present day. Mr. Hems shows us probably the oldest specimen of wood-carving extant. It is a sycamore statuette of an Egyptian, and is now in the Guizeh Museum at Cairo; it was made, so they say, 4,000 B.C. The writer takes the reader through subsequent periods, and gives some excellent photographs of works which are associated with his own name from various parts of the world. He assures the reader that he never read a technical book on wood-carving, and has no sympathy or knowledge of those who attend "wood-carving classes." Without possessing more than a very little general acquaintance of the craft, he has been unconsciously



Cross Sections Showing Arrangement and Connections of Reinforcement Bars in Cleveland Intercepting Sewer.

accumulating knowledge during the fifty years he has been in the trade. The result of his success is here put down under a highly entertaining chapter of practical notes. When, at the outset of his career, Mr. H. Hems was put to work, after his indentures were signed, a little, bandy-legged, bleary-eyed boozier of a man, working at the next bench, said to the lad: "So you're apprenticed, are you? Well, you'll serve your time to poverty." The speaker himself, devoted to "St. Monday," died in the workhouse. Mr. Hems thanks God, saying he has no reason to regret the step taken when he was put to carving, and believes that "few men have been happier or more successful." No one interested in the craft can read Mr. Hems's suggestive chapter without gaining many useful hints and practical tips. He deals with tools and benches, studios and shops, chisels and gouges. Illustrations of a font cover, Chipping Barnet Church, Hertford, and of some pretty stall ends at All Hallows, Barking, show the class of work which the author has had to do. From the same church he gives a good photograph of Grinling Gibbons' font cover, and we have some drawings, too, of four misereres from Exeter Cathedral; also an early crucifix from Lucca Cathedral. The essay concludes with a poem.

A CONCRETE-STEEL SEWER.

THE main intercepting sewer for the city of Cleveland will extend along the lake front to a point about nine miles from the centre of the city. About $3\frac{1}{2}$ miles of it, which is now under construction at a cost of over 1,100,000dol., is 13ft. in diameter inside, and is being built of concrete reinforced with longitudinal and transverse steel rods of the Parnley patent system, two forms of which are used in different parts of the sewer. A section about two miles long is from 35ft. to 44ft. deep, and only 17ft. in the clear away from the centre line of the Lake Shore and Michigan Southern Railway tracks. This portion is being built in open trench, and is shown by the cross-section of intercepting sewer. Water and quicksand were encountered, and the requirements of the railroad company regarding interference with tracks and trains were so severe that continuous lines of 9in. sheet piling 28ft. long were first driven by steam-hammers on both sides of the sewer, and afterwards excavation was made between them by cable machinery, and the piles were braced with 10in. by 10in. and 8in. by 8in. cheek and strut timbers put in as required. Below the 9in. sheet piles one set of ordinary sub-sheeting and bracing was driven into dryer material consisting of very fine sand and blue clay.

The trench was pumped dry, and a massive concrete invert was built in it and lined with two courses of shale brick. Two staggered rows of 2in. by $\frac{1}{2}$ in. soft-steel anchor-bars, 15in. apart on

centres, were built into each side wall and projected above it to receive the main tension bars. The centrings for the arch were set in the usual manner, and the lagging was covered with building paper waterproofed with paraffin. This was accomplished without any difficulty because the tension bars were not yet in place to cause obstructions, but after the centring was prepared 2in. by $\frac{1}{2}$ in. curved transverse bars were bolted to the anchor-bars so as to make an inner and an outer skeleton, the first adjacent and parallel to the intrados, and the second flattened on top at the level of the crown. To these bars were bolted eight lines of horizontal longitudinal $\frac{1}{2}$ in. by $\frac{1}{2}$ in. bars. Portland cement mortar 3in. thick was then laid on the lagging inclosing the inner row of bars and forming a finished surface for the arch soffit through which none of the concrete stone could penetrate. Before this mortar set, concrete was rammed in between it and the sheeting to a height of 18in. above the springing line, and the remainder of the concrete was rammed in place against the 3in. of mortar without the use of outside forms. The upper surface of the concrete was finished with 1in. of Portland cement mortar. The arch concrete was made 1:3:7 with $\frac{1}{2}$ in. screened broken stone. Where voids in the stone exceeded 40 per cent., the proportion was made 1:3:6. Back filling was commenced as soon as the concrete was from six to twelve hours old, but the centres were not removed for two weeks. The paper lining was then pulled off, leaving a surface so much smoother than brickwork that it was calculated to increase the carrying capacity over that of an ordinary brick-lined arch by about 15 per cent. Where the arch was back-filled with 25ft. of clay and wet quicksand, the total depression of the crown was not more than 0.06ft., and the corresponding increase in the length of the horizontal diameter did not exceed 0.08ft., although in some places the sheeting was forced in so as to reduce the thickness of the side walls 3in. A steel arch section 12in. thick, 2ft. long, and having a diameter of 14ft. 9in., was subjected to a load of 57,000lb. when tested to destruction.

The Gilbert-street section of the sewer is about 2,000ft. long and from 24ft. to 30ft. deep. Here round bars instead of flat ones are used for the reinforcement, are hooked instead of bolted together, and are arranged on a different system of combined primary and secondary bars. The primary bars are nearly horizontal at the crown, where they pass near the intrados and thence extend through the arch to the extrados along the haunches and then back again through the arch to the intrados, where they are anchored to the vertical side-wall bars 2ft. above the springing line. These bars are calculated to take tensile stress, but do not afford sufficient reinforcement to the crown, where the tensile strains extend down about 40° on each side, and are further provided for by the secondary bars which alternate with the primary ones, and are bent to

segmental curves with their ends radial so as to lock thoroughly into the concrete. Both sets of bars are $\frac{3}{4}$ in. in diameter, and are 6in. apart on centres at the crown. The $\frac{1}{2}$ in. longitudinal horizontal bars are wired to the transverse bars at intersections. Short vertical bars are built into the side walls at the springing line to resist the tendency of the completed sewer to spread and to prevent the side walls from being forced inwards during construction.

Eight sections of the main interceptor are under contract by this Parnley system, aggregating $3\frac{1}{2}$ miles in length, and contain about 60,000 cubic yards of concrete, 1,700,000lb. of steel, 12,000 cubic yards shale brick masonry, and about 350,000 cubic yards of excavation. It is being built for an average contract price of about 62dol. per linear foot, as compared with about 75dol. per linear foot bid for ordinary brick construction. About $3\frac{1}{2}$ miles of other sewers varying from 5ft. to 12ft. in diameter inside are now being constructed in Cleveland on this system at an aggregate cost of about 540,000dol. By comparative bids for sections 1, 2, and 3 of the intercepting sewer, above described, a total saving between the cost of an ordinary brick-lined concrete sewer and the concrete steel sewer with the invert only lined with brick aggregated over 78,000dol., equivalent to from 19.7 to 22.4 per cent. of the cost. The sewers were designed and construction is superintended by Mr. Walter C. Parnley, M.Am.Soc.C.E., assistant city engineer in charge of sewers.

STEEL CONCRETE.*

STEEL concrete construction is being largely used in this country, as it has been on the Continent and in the United States. The incorporation of the two materials has gone under several names—"armoured" concrete, "reinforced" concrete, "ferro" concrete, &c. Doubt have arisen about its use for beams, floors, arches and tunnels, &c.; the question of the adhesion between the steel and concrete, whether it withstand shocks, resist corrosion, whether its mass not objectionable, have been mooted. The author of "Notes on Steel Concrete," Major J. Winn R.E., has written on the subject for the information of his brother officers who may have to use concrete. The author takes as the basis of his pamphlet "Le Béton Armé," by M. P. Christophe, a work recently published, which reviews the whole question and describes the application of reinforced concrete in France, Germany, Italy, and other Continental and American States. M. Christophe quotes experiments and opinions of various authors, and his work is an authority on the subject. Major Winn discusses the different methods of concrete

* Notes on Steel Concrete. By Major J. WINN, R.E., Instructor of Construction, S.M.E. Chatham: W. Mackay and Co., Ltd.

construction and the various forms of "armouring," after preliminary remarks on the resistance of the materials. Very high powers of resistance have been reached. It is stated that 6,000lb. to the square inch has been attained with 3 to 1 concrete at the end of a month. M. Christophe, after discussing the question at great length, arrives at the conclusion that with 1 to 5 concrete, made of slow-setting Portland cement with an aggregate of sand and crushed stone (passing an inch gauge), the resistance is 2,100lb. after a month. Resistance to tension, shearing, adhesion are discussed, and the resistance of the armature or metal is put at 8,500lb. per square inch for iron, and for steel 12,800lb. for first-class structures. The author quotes the remark that if iron and steel is effectually covered with Portland cement mortar or concrete, it will be completely protected from corrosion, and brings other evidence to show that steel imbedded in the concrete is quite safe. Other remarks refer to water-tightness, fire-resistance. Referring to the forms of armouring, the author says round rods are found to have better adhesion than square, unless the square rod is twisted, as in the Ransome system. Flat bars are less adhesive than square bars. Reference is made to the "expanded metal" reinforcement and its many advantages, which forms a good "key"; its adhesion is perfect, while the labour of fixing is less than that of rods; in flooring also it has some advantages over the single tensional rods. Systems of construction are next dealt with. These are treated under the head of (A) slabs, (B) steel concrete beams, (C) arches, (D) walls, (E) pipes, (F) piles. Of the former the systems after the names of their inventors, Monier, Golding, Hyatt, Ransome, Hennebique, are fully discussed; but we do not enter now into this part of the author's work. Each system is mathematically investigated, and its merits and defects pointed out. In the Hennebique system, which has been favourably entertained, the stress on the concrete is assumed to be uniform in all the compressed parts, and that the moment of forces in compression equals that of the forces in tension. These assumptions are said to be false by M. Christophe—a point which the author treats at some length. The pamphlet embodies a large amount of information in a condensed and useful form, which has been thoroughly threshed out.

ON BUILDING TIMBERS.—XXXVIII.

MEASUREMENT—PRELIMINARY.

ON the threshold of this subject it is well to have a clear understanding of a few simple facts in common arithmetic; for these, in being overlooked by practical men, sometimes lead to rather amusing results in everyday work. It is quite a common thing, for instance, to hear a builder—or, for that matter, a surveyor—talk of multiplying 1ft. 8in. by 2ft. 4in., or some other dimensions in common use, as if such a thing could be done; and when its possibility is challenged, a simple calculation is promptly made showing the product to be 3ft. 8in. and ten parts. Now, if the person who supplied this answer was asked to multiply 2s. 6d. by 4d., he would say the proposition was absurd; yet he did not hesitate in the first case, for he had always worked "cross multiplication" without giving a thought to the nature of the process he was engaged upon. When a person says he multiplies 1ft. 8in. by 2ft. 4in. he talks nonsense, for it is as impossible to multiply these lengths as it is to multiply the cash amounts already mentioned. What was really done in squaring the above dimensions was merely multiplying the number $1\frac{2}{3}$ by $2\frac{1}{2}$, so as to obtain figures which would be the exact number of feet, inches, and parts in a certain surface. To see the impossibility of multiplying feet by feet, or inches by inches, it will be only necessary to confine the operation to linear measurement only, for a slating batten 12ft. long cannot be multiplied by one 3ft. long, any more than 12 pence can be multiplied by 3 pence; in fact, neither one proposition nor the other conveys any intelligible idea whatever to the mind. The difficulty in the matter is solved by remembering that numbers are of two kinds—namely, abstract and concrete, and although abstract numbers may be dealt with according to the ordinary rules of arithmetic, it does not seem possible to deal with concrete numbers even of the same kind in a way to admit of any intelligible meaning. Abstract numbers are those which are considered without reference to any things what-

ever, be they units of measure—such as feet or inches—or the articles measured. Concrete numbers, on the other hand, always express some kind of things—such as feet, inches, ladders, barrows, &c., and in all cases of squaring dimensions numbers only are multiplied, though in ordinary work this is not considered, as the operator, by a mental process, substitutes the things enumerated for the figures dealt with in enumerating them. Everyone engaged in building operations is familiar with the fact that there are three distinct kinds of magnitude—length, area, and solid content; length having one dimension only, area two dimensions—length and breadth; and solid content three dimensions—length, breadth, and depth. The unit of length is always a straight line of fixed length, and the length of any line is defined as being so many of these units, and fractional parts of the unit, if necessary. The unit for the width of board measurement is the inch, and that for the board's length the foot, the former being a sub-multiple of the latter. The distance of the sun is not expressed in inches or feet: a million miles is the unit of measure in this case, so that the unit of measure is generally selected with relation to the magnitude of the line measured; but it is always a multiple or sub-multiple of the primary unit of length. An imaginary square, the side of which is a unit of length, is adopted as a measure of surface, and the area of any surface is determined by the number of times the square unit is contained in it. Whether the surface is triangular, rectangular, rhombic, or circular, its content is always expressed by the number of square units found in it. A cube, the edges of which are each a unit of length, and the sides each a unit of area, is the solid used for the measure of cubical content. This cubic unit is used to measure a sphere or any other body bounded by a curved surface, as well as bodies bounded by plain surfaces. From this it follows that if a number representing the length of anything is multiplied by an abstract number, the quotient will be a number representing length. For instance, if a slating batten 12ft. long is multiplied by 3, the result will be 36ft. of batten; but if a number representing length is multiplied by another representing length, the quotient will be a number representing a surface. Similarly, if a number representing a surface is multiplied by another number representing a surface, the quotient will be a number representing a solid. All these processes may be inverted: a number representing a solid divided by an abstract number will give one still representing a solid; but if the first number is divided by another representing a line, the quotient will be a number representing a surface; but if the divisor represents a surface, then the quotient will be the length of a line. It is therefore plain that when concrete numbers are multiplied or divided by abstract numbers, the kinds of magnitudes of the former remain unchanged; but when concrete numbers are multiplied or divided by concrete numbers, the kinds of magnitudes are invariably altered. The unit of length has been defined as a straight line of definite length; but when it is asked what is a straight line the trouble begins, for "Euclid" defines it to be "that which lies evenly between its extremities," these being points. As a point is merely position without magnitude, a line length without breadth, and a surface length and breadth without thickness, it follows that no one has ever seen what Euclid calls "points," "lines," or "surfaces." This statement will, no doubt, surprise a good many who think that all through their lives they have had the evidence of their senses to the contrary. Nevertheless, not only have they never seen such things, but they will find it quite impossible even to conceive of their existence, for the mental picture of a point must have some dimensions—that of a line some width and of a surface some thickness; yet all these properties are rigidly excluded by Euclid's definitions. Geometry deals with points, lines, surfaces, and solids; and it is claimed for it, as for every other branch of mathematics, that it is an "exact science," and that its deductions are "necessary truths." Mathematicians, who are prone to upset everybody and everything, themselves, and their own "necessary truths" included, assert with the utmost dogmatism that Euclid's definitions are illusive. They say that, though his generalisations are undeniable and his conclusions unimpeachable, his whole system is built on mere hypotheses which are not necessary, are not true, and which purposely depart from the truth, seeing that there

are no real things existing anywhere which correspond to his definitions, not even in our imaginations.

What is clear enough to one person may be wholly unintelligible to another, and as an experiment will often demonstrate what words will never make plain, the reader who has any difficulty in following Euclid's meaning may try to obtain a Euclidean surface, and the effort will probably convince him that the philosophers may be right after all. The most promising way to go about manufacturing it will be to obtain a nice thin board and a well-sharpened joiner's plane. The board will, of course, have an upper and under surface, and the work to be done to satisfy Euclid's definition is to plane away so much of the board that one surface only shall be left. Having placed the board on a bench and commenced work the original upper surface is soon removed, but another has taken its place. The board is certainly thinner; it is, however, a solid with two surfaces, and the planing must be continuous until the lower surface only remains. When that is done, a geometrical surface will be the result and its boundaries will be lines terminating in points. The absurdity of the attempt will soon convince anyone that Euclid's definitions of lines, points, and surfaces are, after all, mere generalisations based on natural objects with which most people are familiar, and that these generalisations are adopted merely to enable the mind to deal with a subject which, without them, would be incomprehensible. Leaving mathematicians and philosophers to settle their differences, it will be necessary here to deal with points, lines, and surfaces of a tangible kind, and such as may be seen and handled—not forgetting that the smaller the point the finer the line, and the thinner the surface the more accurate will the work be where these are used as guides, whether in the office, on the building, or at the bench. A straight line was neatly defined about 2,200 years ago to be the shortest that can be drawn between any two points, and as no shorter line has been discovered since, it is the kind of line that will be invariably referred to here. To understand clearly what follows, it is necessary to examine another definition of Euclid's—that of parallel lines, for they bound the units of surface measurement, as well as of solid content. Parallel lines are those which, being in the same plane, do not meet even if they are extended ever so far both ways; such lines are the joints in floor-boarding. Now, where straight lines are in different planes, the question of parallelism does not arise; the joints in a floor could never be parallel to the joints in the papering on the adjoining wall. On a building one straight line is set out parallel to another by making them the same distance apart, this distance being measured in a direction exactly at right angles to both lines. As philosophers dispute the accuracy of Euclid's definitions of points, lines, and surfaces, so physical scientists are sceptical about his parallel lines. They say that, although our space is tridimensional, the dimensions being length, breadth, and depth, there is somewhere in the universe space of more than three dimensions, the possible number of which they represent by the letter " n ," and that parallel lines do meet in space of that kind. It is not an easy matter to understand this conundrum, but it has some value, for it goes to show that belief without understanding is not a special characteristic of the theological mind. In this world of ours, where parallel lines do not meet, the nearest approach to space of more than three dimensions is to be found in a builder's account for extra work, the possibilities of which may well stagger any mathematician, or even an " n " dimensional philosopher. In this connection one other expression which will be frequently used in subsequent explanations may be defined—namely, the word "angle." When two straight lines diverge from a point they form an angle; the magnitude of which has nothing whatever to do with the lengths of the diverging lines, as it is determined solely by the mutual divergence of the lines. The point where the lines meet is the vertex of the angle, and if a circle is struck with this a centre and a radius of any length, the proportion which the arc included between the diverging line bears to the whole circle, determines the magnitude of the angle. The ancient Egyptians who had 360 days in their year, divided all circles into 360°, and we continue the practice to the present day. The number 360 is a convenient one, for it can be divided without remainder by 2, 3, 4, 5, 6, 8, and 9, and no decimal division

would have allowed of this. In squaring dimensions, "duodecimals" or "cross-multiplication" is used, and these terms are taken by most people in the building trade to mean the same thing, but they do not. To understand this thoroughly it is necessary to know what "duodecimals" really means. The method adopted to express numbers is called notation, and the decimal system is that at present in universal use, for every number may be expressed by nine figures or symbols and a cipher, that is by 0 and the figures from 1 to 9, both inclusive. Whole numbers are always, by the illiterate as well as by the learned, expressed in decimal notation. Take the number 365, for example: in it the 6 stands for 60 and the 3 for 300. In 3,065 the 3 stands for 3,000, the 6 for 60, and the 5 for units as before. The cipher shows that there are no odd hundreds, and it serves to make the 3 stand in the place of thousands. In this, the common kind of notation, the first figure on the right hand denotes its fixed value, the next ten times its fixed value, and so on. Whether therefore fractional parts are expressed decimally or otherwise, all whole numbers are invariably arranged on the decimal system. The symbols which constitute any number are called its digits, and the number itself is equal to a series of powers of 10 multiplied successively by its several component digits. The number 3,065 in this way is equal to $3 \times 10^3 + 6 \times 10^2 + 5$; the number 10 is said to be the radix of the scale. In duodecimal notation 12 is the radix of the scale, so that two new symbols are required to represent the numbers 10 and 11; as there are none in common use, the letters "t" and "e" may be taken to express them. To make this quite clear, let it be well understood that in decimal arithmetic the value of a figure is increased ten times by being moved one place to the left, or diminished tenfold by being moved a place to the right; but in duodecimal arithmetic the value of any figure is increased twelve times by being moved a place to the left, and is diminished twelvefold by being moved a place to the right, and this is in dealing with whole numbers only. It has been shown that in common notation 365 denotes $3 \times 10^2 + 6 \times 10 + 5 \times 1$; but in duodecimal notation 365 would mean $3 \times 12^2 + 6 \times 12 + 5 \times 1$, which in common numbers would be 509. To reduce any ordinary number to a duodecimal, divide the number by 12 and note the remainder, divide the quotient again by 12 and note the remainder, and so on, until the quotient 0 is obtained, noting the remainders in each case; the duodecimal required will be the remainder written down in reversed order.

Suppose it is necessary to express 15186 in the duodecimal scale—

12)15186 Here 8596 is the number.

12)1265—6

12)105—5

8—9

Suppose, again, it is required to know the duodecimal of 221323—

12)221323

12)18443—7

12)1536—e

12)128—0

12)10—8

0—t Ans.: t80e7.

Suppose, now, it is necessary to reduce 8956 in the duodecimal scale to the ordinary or decimal scale: Multiply the first figure of the duodecimal by 12, and add the second figure; multiply this sum by 12, and add the third number, and so on, multiplying by 12, and adding the next figure till the last is reached. The result thus obtained is the equivalent number in the ordinary scale.

For example, let it be required to reduce the duodecimal 8956 to the ordinary scale:—

8956

12

105

12

1265

12

15186

Here 8, the first figure, is multiplied by 12 and

9 added; the result is multiplied by 12 and 5 added, and the result is again multiplied by 12 and 6 added; the last result, 15186, is the number required. Taking the other duodecimal given above, it may be reduced in the same way:—

t80e7

12

128

12

1536

12

18443

12

221323

In this case, the first figure "t," or 10, is multiplied by 12 and 8 added; the result is multiplied by 12 and nothing added. In the next operation the result is again multiplied by 12 and "e," or 11, added, and so on until the final result is 221,323, the number required. Suppose now that this duodecimal arithmetic is applied in practice—say, for instance, in multiplying 17ft. 5in. by 13ft. 7in.; here it will be necessary to reduce the 17 and 13 to the duodecimal scale—

12)17

12)13

1—5

1—1

17 therefore becomes 15, and 13 becomes 11, the answer is then worked out thus—

15.5

11.7

t1e

155

155

178 6e

Reducing 178 from duodecimals to ordinary figures it will be 236, so that the answer is 236ft. 6in. and 11 parts. Perhaps it may be well to describe this process more minutely. In the calculation given above 7 is first multiplied into 5 which gives 35; this divided by 12 is 2 and 11 over, this latter number is written "e" and 2 carried; 7 times 5 are 35 and 2 are 37, which, divided by 12, is 3 and 1 over; 7 by 1 are 7, and 3 added makes 10 (written t), and so on with the other figures. In the addition, "e" is brought down, next 6, and in the third row, 5 and 5 are added to "t," or 10, they make 20, which divided by 12 leaves 1 and 8 over, this last is set down and one carried, and so on. The 178 is reduced to an ordinary number thus—

178

12

19

12

236

Now when a surveyor or builder squares dimensions, by "duodecimals," as it is called, do either of them work out the calculation in this way: Not one! So that what is called in the profession "duodecimal arithmetic," is nothing of the kind, it is rather a mongrel sort of calculation, the whole number being one of the decimal scale, and the fractional parts of a foot (in twelfths) being duodecimals. If, in squaring dimensions all denominations were inches, 12ths of inches, 12ths again, and so on, they might be multiplied thus—say it is required to know the contents of a surface, 3in. 4pts. 3sec. by 2in. 4pts. 4sec.

in. pt. sec.

3 4 3

2 4 4

6 8 6

1 1 5 0

1 1 5 0

7 11 0 5 0

this is ordinary "cross multiplication," but the same result may be obtained duodecimally thus—

343

244

1450

115

686

76050

here the result is the same 7in. 11pt. 0sec. 5 thirds. It will perhaps surprise many to know that whilst

the decimal scale is held up as being perfection by some, it is considered by others as very much inferior to the duodecimal scale described above, for the number 10, the radix of the decimal scale, has only two aliquot parts, whilst 12 has double the number. This explanation of duodecimal arithmetic may be closed by giving an example of ordinary cross multiplication and the same by the contracted notations.

Multiply ft. in. pts. sec.
By 4 8 6 5
3 4 9 8

14 1 7 3
1 6 10 1 8
3 6 4 9 9
3 1 -8 3 4

16 0 4 11 2 0 4
ft. in. pts. sec. 3rds 4ths 5ths

By contracted notation:—

4 8 6 5 or 4 8 6 5
3 4 9 8 3 4 9 8

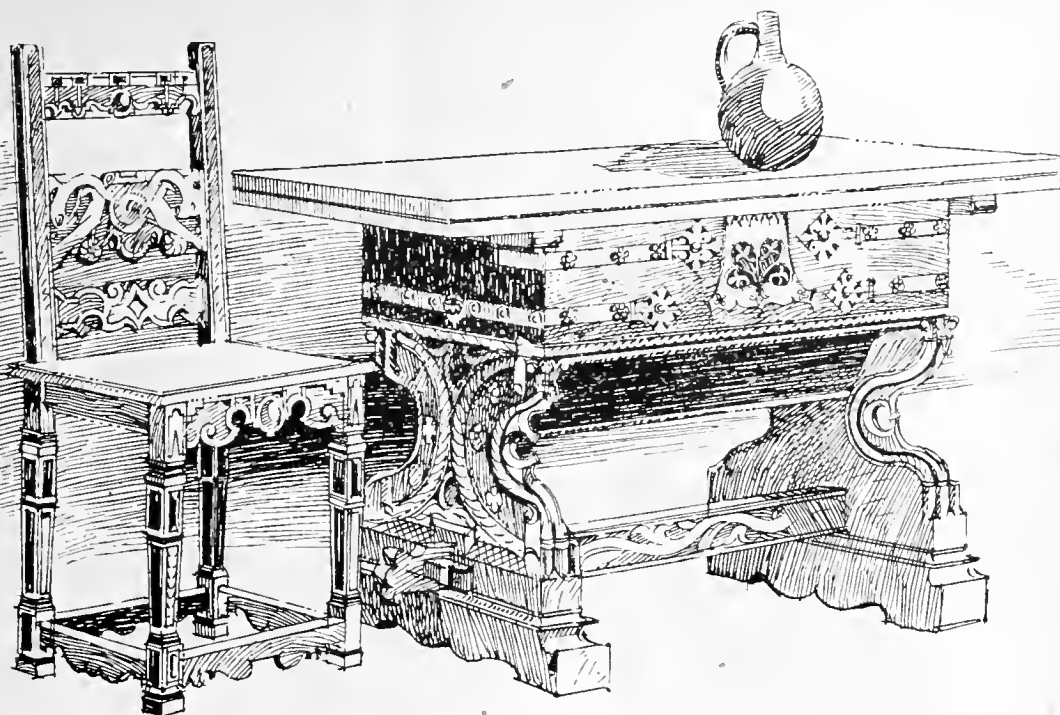
3 1 8 3 4 1 4 1 7 3
3 6 4 9 9 1 6 t 1 8
1 6 t 1 8 3 6 4 9 9
1 4 1 7 3 3 1 8 3 4

In squaring dimension—where in lineal measure inches are mentioned—they are, of course, the twelfth part of a foot; but in superficial measure an inch is really 12 square inches, and in cubic measure an inch is 144 cubic inches; so that the expression 12 feet 5 inches board measure really means 12 feet 60 inches, for there are 144 inches in a superficial foot, and 12 feet 5 inches in cubic measure is 12 feet 720 cubic inches, for there are 1,728 cubic inches in a cubic foot. Building timber is usually formed and measured in well-defined geometrical figures, and a few of these will embrace all the forms ever likely to require solution at the hands of the measurer. In fact, the architect and surveyor seldom deal with any but rectangular surfaces, or solids bounded by such surfaces. The timber merchant, however, deals with cylinders and truncated cones, so he has to call in the aid of "Hoppus" to assist him in solving them. Before dealing with the various ways of measuring timber adopted by the trade, or the standards in use, it will be necessary to explain how simple areas and contents in solid measure may be obtained. The area of a square is obtained by multiplying the length of a side by itself—"squaring" it, in fact. The side of a square is obtained from the area by extracting its square root, and the diagonal by multiplying the side by 1.4142. The area of a rectangle is obtained by multiplying the length by the breadth; if the area is divided by the length the side is found, and the area divided by the side gives the length. In a parallelogram, the area is the length of the side multiplied into the vertical height (not the slant height). Triangles seldom occur in timber measuring: when they do they may be estimated by rectangles, the base being the side and the width half the vertical height of the triangle from its base. A triangle is equal in area to a rectangle on the same base, and half the vertical height. To compute the area of a circle, multiply the square of the diameter by .7854; or multiply the square of the circumference by .07958; or multiply half-circumference by half-diameter; or square the radius and multiply it by 3.1416. The surface of a sphere is obtained by multiplying the diameter by the circumference, or multiplying the square of the radius by 12.5664, or multiplying the square of the diameter by 3.1416.

PRACTICAL MASONRY.*

WE gave a short notice of Mr. William R. Purchase's work on "Practical Masonry" on its first appearance, so that it is not now necessary to add very much more to our previous remarks. The author lays no claim to deal with the theoretical principle of stonemasonry or its architectural character, but confines himself to introducing the student to the practical work of masonry and to initiating young beginners. The author writes as an operative stonemason who had

* Practical Masonry. By WILLIAM R. PURCHASE, Builder Inspector to the Borough of Hove. Fourth Edition. London: Crosby Lockwood and Son.



AN OLD GERMAN TABLE AND CHAIR.

reached the rank of foreman mason, and for this reason his work is thoroughly practical in its method. The cases commonly met with on buildings are selected, and the examples are chiefly from actual work. Tools and appliances naturally occupy the first place, and these will be found to include all the tools generally used—hammers, chisels, “boasters,” claw tools, pitchforks, jumpers, picks, axes, each being illustrated. Other plates, illustrate the manner of splitting blocks of stone by wedges, &c. Arches and joints are described and illustrated by several diagrams showing the concealed joint used in piers and architraves, joints used in landings like the joggle, the rebated joint, horizontal and right-angle and rebated bed-joints to stone spires, &c. The method of forming a plane surface on a rough block is illustrated by the method of “boning” pegs or cubes of hard wood placed at the corners of block, upon which straightedges can be placed for “boning” or sighting. The superfluous roughnesses are then pointed off, and the surface dressed to a finished face. The useful sample of working a length of cornice out of a rectangular block is clearly illustrated by isometrical diagrams showing the processes of working the beds and joints, scribing the mould of the arch or moulding, chiselling out the sunk parts, setting out the entasis of columns, the method of finishing or enlarging mouldings, the setting out of working of stone stairs, stairs with winders, development of the plan of stairs with winders, the mode of setting-out winding stairs, are noted. These processes are shown in four plates drawn to a good scale. Four other plates illustrate circular work, a terrace stair and balustrade, or “ramp work, a twist.” The method of working the blocks showing the bed and face-moulds of plinth and coping is clearly described. Arches, circular plain, with large scale diagrams of developments, working the stones, circular arches in cylindrical walls, niches and skew arches are fully explained and illustrated also. Cylindrical coping, the masonry of domes and pendentives, joining form other chapters, and good examples of worked out. These and other parts of the book were given in the early edition. Gothic buildings of the different periods are illustrated, and form a useful summary of mouldings and arches, followed by a précis of Grecian and Roman mouldings. We now come to the sections dealing with masonry estimating, and quantities, and a useful list of

building stones in the market. The author makes some useful remarks on the quantity surveying of stonework. Our readers know there is great diversity in estimating stonework or the labour on it. The author says: “At one time half-sawing was taken on all the six sides of the cube, and any labour expended on these sides or faces was added; but now what is called the ‘London system’ of measuring being generally adopted, half-sawing is ignored, except for the back of the stone built into the wall, it being assumed that all other labours include the price of sawing.” The author refers to Mr. Leaning’s method, which is to take out the stone including labour, and to divide it into a few main items each composed of stone, upon which the labour is similar, and giving sketches to the more ornate parts, as “stone and labour in chamfered jambs,” “ditto in moulded ditto,” &c. The method adopted by the author is to measure net the cubical block of stone, and take all the labours upon it separately, which is known as the “London system.” Full directions are given for measuring. Thus the net size of block is measured, any fraction of an inch being called another inch. Add to the price of stone the labour of hoisting, setting, and scaffolding per foot cube, and so describe. State how finished—whether tooled, chiselled, rubbed, dragged, combed, &c. Stone hoisted 40ft. is kept separate, and also in heights of 20ft. above same, as 40ft. to 60ft., 60ft. to 80ft., &c. All stonework up to 3in. in thickness is taken by the foot super., and all labours described. Any stone above 6ft. in length is cubed, called “scantling.” Beds and joints per foot super. are described as “one face measured for two.” “It is usual to take a bed and a joint to each stone which will be equal to half-bed or joint on four out of the six surfaces of the block, that is, the top, bottom and two sides. Sometimes beds and joints and preparatory faces are omitted, and the stone described as including all plain beds and joints, &c. When this course is adopted, every other labour is measured as it finishes,” &c. Many other useful rules are given of use to the estimator: thus, the labour to back of stone is described as “half-sawn” or drafted and measured by the foot super. Examples of taking out quantities of stonework are given for a main cornice and balustrade, with abstract of same, and the bill priced, also for a doorway and a column. These practical examples of bills of quantities will be found of service by the

student and mason, and add much to the value of this edition. In the section on Building Stones the author gives some useful advice about the importance of a mason having a knowledge of the structure of rocks, and the situations where the best material is obtained, the composition of stones, &c. Many suggestions are given for testing. The author refers to the report of the Royal Commission appointed in 1838 to report and advise on the most suitable stone for the Houses of Parliament; but the result of the selection, as we know, has proved unsatisfactory. The remarks on “Weathering,” “Seasoning,” “Appearance,” “Porosity and Absorption,” “Natural Bed,” “Facility of Working,” “Compactness and Weight,” &c., are worth reading, and a list of the principal quarries of Great Britain where stone is obtained are useful; these refer to sandstones and limestones.

AN OLD GERMAN TABLE AND CHAIR.

THESE two charming pieces of old furniture are thoroughly Gothic in their construction and design, and yet at the same time well accord with comfortable use, for which they were intended, which is more than can be said of much of the modern Medieval furniture produced during the time of the Gothic Revival. These pieces contrast favourably also with a good deal which passes as original under the contemporary influence of the Arts and Crafts movement. The pieces are strong without being lumpy and ungainly, while at the same time elegance has been obtained without weak and thin long drawn out lines. Mr. William Flockhart has enabled us to illustrate these examples.

A sub-committee of the Wakefield City Council, authorised to obtain a site for a hospital for infectious diseases, has approved of one of 14 acres 2 rods 5½ poles of land, situate on the north side of Batley-road, Alverthorpe, which has been offered them on behalf of the Countess of Cardigan for £2,000.

A joint meeting of the estate and property committee and sanitary committee of the Newcastle-on-Tyne Corporation has been held to discuss the type of houses to be erected on the Walker Estate for artisans’ dwellings. It was considered advisable to erect several blocks of self-contained houses of four rooms, with a bathroom.

BOOKS RECEIVED.

How to Measure-up Woodwork for Buildings. By OWEN B. MAGINNIS, architect, Inspector of Buildings City of New York, &c. Illustrated. (New York: The F. J. Publication Company.)—This is a small handy volume, "describing the simplest method to be followed when figuring up the woodwork required for either brick or frame houses." The methods differ a little from our English plan of measuring joinery, and the details of window-frames for brick walls are not quite as we dopt. Various details of vertical and horizontal sections of window and door frames are illustrated for brick, stone, and framed walls. The author says brick frames are usually measured both in height and width by the height and width of brick opening. For framed or wood walls the dimensions are taken from sill to head, two cross studs, top and bottom, and an inch allowed for clearance between the studs. The width is taken between the studs, and 2½ in. is added for a sash-weight box to permit them to run up and down freely. Door jambs, casings or "trims," or architraves, skirtings, window "trims," wainscot panelling, doors of various kinds and house fixtures, dressers and cupboards, &c., are all illustrated by examples; the method shown of panelling for doors are not those we can approve, but are certainly American. Measuring-up stairs, balusters, and handrails, is another chapter. Many useful suggestions are given for measuring up rough timber and floors. Taking a square of flooring, a certain number of boards go to every square, from which the lineal feet of a given width can be got. Thus—if 6 in. boards are required, we find there are 10sq.ft. in two boards 10ft. long placed together, or 10sq.ft. in one board 20ft. long. Then, if one board makes 10sq.ft., how many will make 100sq.ft.? Multiply $10 \times 10 = 100$, which multiplied by 8½ = 833½, which will be accurate enough for all practical purposes. The last chapter contains useful data as to nails required, weight of lumber, windows and doors, shingles, &c. This book ought to be of much use to all builders, carpenters, and others. Its price is 20 cents.—The seventh edition of *A Digest of the Law of Easements*, by L. C. INNES (London: Stevens and Sons, Ltd. 7s. 6d.) embraces several important cases which have come before the Courts since January 1900, and is thus brought well up to date. It is hardly necessary to add that the care exercised in the computation of this excellent textbook renders it invaluable.

The Grand Duke Michael of Russia will unveil at Newcastle-under-Lyme, on Thursday next, a bronze statue, on a granite base, of Queen Victoria. The statue, which will occupy a conspicuous position in Nelson-square, has been given by Sir Alfred Seale Haslam, M.P., in commemoration of the Coronation, and is a replica of the one on the Thames Embankment at the corner of Blackfriars Bridge, given by Sir Alfred on the occasion of the late Queen's Jubilee.

In the case of the application on behalf of Albert Edward Lewer, Southwick, late Hove, both Sussex, builder and contractor, the order of discharge has been suspended for two years, ending Aug. 7, 1905.

The Local Government Board has sanctioned a loan of £14,117 to the Cheltenham Corporation for the purposes of wood paving in the principal streets along the route of the proposed extension.

The city council of Exeter have granted a site opposite the entrance to Bury Meadow, on which will be erected the equestrian statue of Sir Redvers Buller.

The new women's hospital which is being erected in Cannought-road, Wolverhampton, is to be opened in January next. The site, which is close to the West Park, has been presented by Mr. J. L. Gibbons, of Ellowes Hall, Sedgley, and the cost of the structure will amount to about £12,000. We illustrated the building, of which Mr. A. Elton Painter, of Wolverhampton, is the architect, in our issue of April 17 last.

The Board of Agriculture notify that the publication of the revised Ordnance Survey maps, on the scale of 2½ in. to one mile, is in progress for the County of Suffolk, and is proceeding from south to north.

At Lishbellaw, County Fermanagh, a co-operative creamery has been erected adjoining the Great Northern Railway. Mr. James Harvey, Enniskillen, was the contractor.

The Local Government Board have sanctioned the sewerage scheme promoted by the Bury St. Edmunds Town Council, and they have also sanctioned a loan of about £3,000 to carry out the work.

OBITUARY.

Mr. J. THORNBURN ROSS, a well-known Scotch artist, and an Associate of the Royal Scottish Academy, died on Monday in the Edinburgh Infirmary from injuries believed to have been sustained through a fall down a flight of stairs in his studio. He was a son of the late Mr. R. T. Ross, R.S.A., Edinburgh. Among his leading works were "A Garland of Poppies," exhibited in 1889; "The Girl I Left Behind Me," in 1890; "Where Do the Fairies Dwell?" in 1891; "Serato Veneziana," in 1892; "A Daughter of the Soil" and "The Poppy Field," in 1894; "The Beau of the Hiring Fair," exhibited in 1900; and a view of the Bass Rock, with sea-fowl, shown in 1901. Mr. Ross was elected an A.R.S.A. in 1896.

Mr. JOHN GREENWOOD, builder and contractor, of Arthur-street West, and a much-respected member of the City Corporation, died on Saturday last, aged 65 years. Mr. Greenwood entered the Court of Common Council as a member of the ward of Candlewick in 1885, and in 1894 became Deputy Alderman of the ward. A year ago, on the resignation of Sir John Moore, he was a candidate for the vacant gown; but, after a friendly contest, was defeated by Mr. Alderman Burnett, who reappointed him as deputy. He was a leading member of the Masons' Company.

Mr. WALTER DICKSON, one of the best-known architects in New York State, died in Brooklyn last week at the age of 68. Mr. Dickson was for many years established in Albany, N.Y., where he executed many important commissions, and gained the highest esteem of the profession and the public. He was the architect of the Albany Post-office and of the Albany City Prison, among other public buildings. He removed to Brooklyn some fifteen years ago, and formed a partnership with Mr. Withers. The firm of Withers and Dickson carried out much important work, and prepared the selected designs for the Tomb of the Prison, but the execution of the work was intrusted by the authorities to others.

CHIPS.

The new tramcar shed that has been erected in Hylton-road, Sunderland, for the Sunderland Corporation was formally opened on Wednesday by the chairman of the tramways committee. The car shed is 346ft. long by 62ft. 6in. wide, and the height to the trolley wire is 21ft., while the height to the apex of the roof is 36ft. The fitting shop, which is a continuation of the car shed, is 40ft. long, and the total area of the site is 5,430sq. yds.

At the town-hall, Birkenhead, on Tuesday, Col. W. Langton Coke, M.I.C.E., held an inquiry on behalf of the Local Government Board, concerning the application made by the Birkenhead Corporation for sanction to borrow £4,007 for the purchase of a site for public baths at the south end of the borough. The site is on the side of Old Chester-road and in the rear of Alexandra-terrace, Bedford-road, Rock Ferry.

On Wednesday afternoon, at Blaydon, the foundation-stones were laid of a new Catholic Church and Presbytery, to be erected at a cost of between £8,000 and £9,000.

On Tuesday, Mr. W. A. Ducat, Local Government Board inspector, held an inquiry in the Stothard Memorial Hall, Monkton, into the application of the South Shields Rural District Council to borrow £900 for the purposes of sewerage works in Monkton village.

The annual meeting of the East Riding Anti-quarian Society took place at York, on Monday and Tuesday. The members spent the second day in a round of visits to the churches of the city to see the ancient stained-glass which they contain. The party, who were under the guidance of Mr. J. R. Boyle, F.S.A., of Hull, visited some eight churches.

A window to the memory of the late Mr. W. E. Geach, was dedicated by the Lord Bishop of Truro at the parish church, Tywardreath on Monday. The window, which was designed and erected by Messrs. Fouracre and Son, of Stonehouse, is placed in the tower, which contains the chimes, the last present of the deceased to the church. The window contains three lights, and represents "Our Lord." The central figure is the "Good Shepherd," the right-hand one "I am the way: follow Me," the other light "I am the bread of life." The upper part of the window is filled with four angels bearing shields symbolic of the four Evangelists.

The Isle of Walney Estates Company have received an order for eight million bricks for Admiralty forts to be erected on the west side of Walney Island. The order is regarded as the first step towards the erection of forts to protect Vickers' shipyard and the town generally.

Engineering Notes.

ELECTRIC TRACTION ON THE NORTH-EASTERN RAILWAY.—The North-Eastern Railway Company have completed a portion of the first section of the local lines which it proposes to equip electrically, and had trial runs on Sunday. The line is part of that between Newcastle and Tynemouth, the distance being three miles. It is on the third-rail system, the power being supplied by the Tyneside Power Company from a station at Wallsend. Two motor-cars are used with a trailer between; each motor is of 125H.P., the energy being taken from the third rail by a shoe brushing over it. The cars obtained a maximum speed of 45 miles an hour. The multiple unit system is used.

Mr. Aston Webb, R.A., P.R.I.B.A., has been elected *Membre Correspondant* of the Société Centrale des Architectes Français.

At a meeting of the archdeacons and rural dean of the diocese of Bath and Wells held to appoint diocesan surveyors, in accordance with the provisions of the Ecclesiastical Dilapidations Act, 1871, for the ensuing five years, the following were duly elected:—Mr. C. R. Wainwright, of Shepton Mallet; Mr. E. M. Hippisley, of Wells; and Mr. A. H. Cottam, of Bridgwater. Messrs. Wainwright and Hippisley have held the office for many years, and Mr. Cottam succeeds Mr. Samson, who has resigned the office after holding it for twenty years.

The new Wesleyan Central Hall in Corporation street, Birmingham, which has been built as a 20th century memorial, was opened on Wednesday week. The hall, which has been erected opposite the Victoria Law Courts, is in the Renaissance style and has cost £65,000. From the centre rises a turret 180ft. high, and on the ground floor and basement are shops and warehouses. The great hall will seat 2,000 persons, and the Synod hall will accommodate 450. There are also rooms for Sunday-school, library, gymnasium, and girls' and men's clubs.

The new grand staircase and isolation wards at sundry other alterations, which necessitated the closing of Charing Cross Hospital on June 18 last, having been completed, the hospital will be reopened for in-patients and out-patients on Monday next. Mr. A. Saxon Snell, F.R.I.B.A., is the architect for the extensions, which have been carried out at a cost of about £90,000 by Messrs. Hollow Brothers.

Wm. Goldie, one of the leading builders in Chicago, died on Sept. 7 in that city. Although 78 years of age, he took an active interest in so large contracts his firm was carrying out for a Louisiana Purchase Exposition, as in previous years for the expositions at Buffalo and Omaha.

The new Royal Victoria Hospital at Belfast, built at a cost of £100,000, and formally declared open by the King during his Majesty's recent visit, was on Friday for the first time occupied by the patients from the old Royal Hospital in Frederick-street.

Of the £20,000 required for the development of the properties acquired at Bethesda by the New Wales Quarries Ltd., over £18,000 has now been subscribed. More than half of the shares are held by co-operative societies. The slate being produced has been pronounced by experts to be of excellent quality, and the demand is far in excess of the production. Only one of the quarries is at present being worked, but it is hoped that before long operations will be begun at the other properties.

Two extensions of the electric tramway route were opened at Newcastle-on-Tyne on Saturday. One ends at Adelaide-terrace, Benwell, the other from the Stack Hotel, Low Walker, to Walker Railway Station.

The tender of the Columbian Fireproofing Co. Ltd., 37, King William-street, E.C., has been accepted for the steelwork, fireproof floors, galleys, and landings required for Chilworth Manor, Hants, for which the architects are Messrs. Colson, Farrer, and Nisbett, 29, New Bridge-street, E.C., are now fast proceeding with the work for the large mansion house of Hursley Park, Winchester, for which in short time ago they obtained the contract for the constructional steelwork and fireproof construction, the architect of this work being Mr. A. Marshall Mackenzie, A.R.S.A., 343, Union-street, Aberdeen.

The Highworth Rural District Council have resolved to further consult Messrs. Beesley, and Nichols, of Westminster, in connection with the sewerage and sewage disposal of Rodbourne Chert.

At the last meeting of the corporation of Ipswich Mr. Frederick Bennett, builder, of Fore-street, Clement's, and a councillor for St. Clement's Ward, was unanimously elected as alderman, in succession to the late Mr. Alfred Wriuch, wholesale ironmonger.

Building Intelligence.

DUNDEE.—The authorities of University College are at present considering a scheme for the improvement of the college on an extensive scale, and an appeal is being made for assistance to permit of the undertaking being carried through. The present buildings consist of a row of detached villas, facing the Nethergate, and joined together by a corridor running from end to end. These, it is proposed, should be replaced by a building which will stretch over the present frontage, but erected further forward, and there will be contained in it the departments of zoology, botany, geology, mathematics, law, and the subjects of the arts curriculum. Sir Rowand Anderson, Edinburgh, who has been consulted, estimates the cost of the undertaking at £80,000; but it is suggested that the work might be taken up in sections. The funds in hand have been greatly depleted, and there is now only £8,000 available. To erect the first section of the buildings it is calculated £18,000 would be needed.

EDINBURGH.—During the summer vacation the four higher-class schools belonging to the Merchant Company, which were reopened on Tuesday, have been put into a state of good repair, the painting of the buildings this year having been done on a much more extensive scale than formerly. An important addition has been made to George Watson's Ladies' College. A new wing has been added to the east side. In the basement floor there is a cookery lecture-room, besides a luncheon-room, with a suite of lavatories in the rear. On the first floor is the classroom for physical science. The chemical laboratory occupies the second floor, and the top room is set apart for the teaching of art. These classrooms measure each about 45ft. by 3ft. Steps are being taken with the view of carrying out the scheme, whereby new buildings will be erected for James Gillespie's School, to be temporarily occupied by the pupils of the Edinburgh Ladies' College during the proposed entire reconstruction of that institution. In the mean time Mr. G. Washington Browne, R.S.A., engaged in the preparation of plans for the consideration of the Governors of the contemplated new buildings at Gillespie-crescent.

GATESHEAD.—The new church of St. Chad, in Westminster-street, was consecrated by the Bishop of Durham on Tuesday. The building has been erected from the plans of the late Mr. W. S. Hicks, of Messrs. Hicks and Charlewood, Newcastle; it has cost altogether £26,000, borne by Messrs. Easton. The lofty building, with its central octagonal tower and low eastern chapel projecting beyond the choir, resembles a miniature cathedral. The style of the building is, in its main, based on the Early Perpendicular. The principal entrance is by a porch on the north side of the church. Above the door of this porch are three niches holding statues representing St. Aidan, St. Aidan, and Theodore of Tarsus. Entering the church, a prominent feature is the font in Derbyshire alabaster, with its tall oak canopy. The font is surrounded by eight small statues. Above and behind the font is the west window with stained glass, which has been placed in memory of the architect, Mr. Hicks. Its six lights are divided by a central mullion into two sets of three lights each. The three southern lights illustrate the idea of the building of the material fabric, and the three northern the building of the spiritual fabric. The pulpit, in carved oak, has four panels in relief. The whole scheme of decoration in the sanctuary springs from a fresco painted by Mr. Eadie-Reid below the east window. The subject is "The Annunciation." Above the fresco is the seven-light east window, with three tiers of subjects representing the Nativity, the Crucifixion, and the Lord in Glory. The organ, built by Messrs. Abbott and Smith, has three manuals, and is placed in a chamber on the north side of the choir. The choir vestry and the clergy vestry south are connected by an ambulatory aisle behind the high altar. This ambulatory gives access to the chapel, dedicated to All Saints, which is to be used for the daily services. Messrs. Hicks and Charlewood, Newcastle, are the architects; the contractor, Mr. Isaac Hewley, Dunston; clerk of works, Mr. F. Caldecleugh, Durham; the woodcarving executed by Mr. Ralph Hedley, Newcastle; metalcarving, font, &c., Mr. Beall, Newcastle; stained glass, Messrs. Taylor, Loughborough; stained glass, Messrs. Percy Bacon and Brothers, London;

frescoes, painted panels, and designs for carved figure panels, Mr. J. Eadie-Reid.

HIGHGATE, N.W.—Dedication services were held at St. Michael's Church, Highgate, on Tuesday. The decorations at the east end of the chancel, which have been executed at a cost of about £500, from the designs of Mr. Temple Moore, of Hampstead, were seen for the first time. Four statues of early fathers of the church (Athanasius, John Chrysostom, Augustine, and Jerome) have been placed in the niches by the side of the beautiful large stained-glass window, and the walls have been decorated in a Late Gothic style in keeping with the architecture of the chancel, which was built from the designs of the late Mr. E. Street, R.A. Below the niches is a new stone cornice to the reredos, richly carved in vine-leaf pattern. The figures are also in stone, and these and the cornice, together with the window jambs and tracery, have been painted and gilded, and the walls have been diapered in colour. The reredos has been coloured and a new retable has been added to it. On each side of the reredos the walls have been supplied with hangings.

HOLT, NORFOLK.—Field-Marshal Sir Evelyn Wood, V.C., formally opened on Wednesday the new school buildings at Gresham's School, Holt, Norfolk. The school was founded by Sir John Gresham in 1554, and its management was vested by the founder in the Fishmongers' Company. The governors have now reorganised and rebuilt the school. The new premises, which were begun two years ago, are situated upon the north side of the Cromer-road. Built in separate and detached blocks in the Domestic Renaissance style, with the exception of the school-hall, which is in Late Gothic, the building to the west contains the master's house, dining-hall, boys' studies and dormitories, kitchens, and offices; the eastern block contains the school buildings, assembly-hall, laboratories, and workshops; and the boys' dining-hall is situated in the centre of the first block. The school building proper contains the assembly-hall, which is 70ft. by 32ft., with tracery windows and open-timber roof. From the hall a wide corridor extends westwards, with classrooms and cloakroom on the north side, ending in a return wing containing the laboratories, workshops, and lecture-rooms. Electric light is supplied from a generating station specially erected in the grounds. Mr. Howard Chatfield Clarke, of Bishopsgate-street Within, E.C., is the architect of the school, which was illustrated by a double-page perspective and four plans in our issue of August 15, 1902. The builder is Mr. Geo. Riches, of Church-street, Cromer.

HUNSLLET, LEEDS.—The new workhouse and infirmary at Rothwell Haigh, which had been built by the guardians of the Hunslet Union, at a total cost of £85,850, were opened yesterday (Thursday). The new workhouse and infirmary occupy a site of eighteen and a half acres near the junction of Wood-lane and Wakefield-road at Rothwell Haigh, space being allowed for future extensions. At present accommodation is provided for 450 inmates, so that the cost works out at £182 per inmate. The establishment consists of six groups. The entrance building contains porters' rooms, receiving and vagrant wards on the cellular system, and also rooms for storing clothing. The workhouse proper has the administrative block in the centre, with the committee-room, business offices, and master's house in front, and dining-hall, kitchen, workrooms, matron's office, bakery stores, &c., in the rear. Connected by glazed conservatory corridors with the main block are pavilions for the male and female aged and able-bodied classes, with the necessary dayrooms, officers' rooms, bathrooms, &c. The laundry and boiler-house are situated between the main building and the infirmary.

LIVERPOOL CATHEDRAL.—A special meeting of the Liverpool Cathedral Committee was held on Monday, Mr. Robert Gladstone presiding. There were also present the Earl of Derby, the Lord Bishop, Mr. G. F. Bodley, R.A., and Mr. G. G. Scott (architects), Mr. George Bradbury (surveyor), and Mr. J. Alderson Smith (secretary). Samples of various stones were submitted, and it was resolved, after careful consideration, to employ the local red sandstones in the erection of the cathedral. The architects also submitted plans of details, and it is expected that the arrangements will be made for laying the foundations early in the new year.

PETERBOROUGH.—New premises for the school of art have been built on a site in the Broadway,

originally purchased by the city council for a cattle market, but not hitherto utilised. The plans have been prepared by Mr. John W. Walslaw, the city surveyor, and the cost has been about £4,000. The building has a frontage of 80ft. to the proposed corner of Geneva-street, and a depth of 110ft. The main doorway leads from the Broadway, and the entrance-hall the staircase leads to the upper floors. The first three rooms on the ground floor, with a frontage to the new street, are 21ft. wide. Beyond comes the lecture-room, 21ft. by 24ft., with a gallery to seat 80 students. The last is the mechanics' room, 24ft. by 18ft. 6in., fitted with the engine, shafting, lathes, and so forth taken from the old school. The upper floor consists of a library, 11ft. by 22ft., a master's room, two advanced art-rooms, 15ft. by 20ft., cloak-rooms, and so forth. The contractor was Mr. J. Lucas.

PUDSEY.—The technical school in connection with the mechanics' institute has outgrown its accommodation, and the urban authority, therefore, purchased and altered a two-storied building in Robin-lane. Formerly a wool-store house, this building has been adapted to its new purposes. There are two classrooms on the ground floor, each 22ft. by 11ft. Another room on the same floor, 33ft. by 19ft., will be utilised as a textile department. On the upper floor is a large lecture-room, capable of being divided into two apartments, which are to be used as engineering and building construction departments. Other branches will find accommodation in two other classrooms on the same floor. The alterations have been designed by, and carried out under the supervision of, Mr. Herbert Hodgson, of Leeds and Bradford.

SHEFFIELD.—The new premises recently erected at Westville for Mr. J. G. Graves were formally opened on Friday. The site extends from the Durham-road to Western-bank. The buildings comprise two blocks connected by corridors on each floor running north and south, flanked outside by a garden and courtyard. The south block has four floors, the three upper ones being devoted to offices, the basement being occupied as offices, stationery stores, and heating chambers. Block No. 2 contains five floors, the basement being used principally for stores, strong rooms, &c., and the first, second, and third floors for offices. On the top floor is a recreation room, 77ft. 6in. long and 49ft. 6in. wide, adjoining which are kitchens, scullery, pantry, larders, still-room, stores, reading-rooms, bathrooms, and lavatories. The staircases are of stone, with walls of light-coloured glazed bricks. The sash windows are fitted with National Accident Prevention casements. The buildings are faced externally with the best red bricks from Dennis's, of Ruabon (who also supplied the glazed bricks used in the interior), and ashlar stone from the Stoke Hall quarries. The floors throughout are of cement concrete and steel joists, the surface being laid with maple wood blocks. The buildings are roofed with green Westmoreland slates, and the staircases are of Greenmoor stone. The buildings are heated throughout on the low-pressure hot-water system. Large extraction shafts are provided from basement to roof to carry off the vitiated air with a Boyle's air-pump fixed at the top. The buildings have been designed by and carried out under the superintendence of Messrs. Holmes and Watson, architects and surveyors, and have been erected by Messrs. George Longden and Sons, contractors, all of Sheffield, Mr. J. Brooks acting as clerk of the works.

SOUTHAMPTON.—The memorial stones of St. Barnabas' Church, at the corner of Lodge, and Rose-roads, were laid last week. The church is Late Gothic in style, and is of very simple plan, it being a parallelogram divided into three parts by two arcades. Its length is 115ft., and width 51ft. in the clear of the walls. There is no chancel arch, but the nave arcade is continued one bay beyond the dwarf stone wall dividing the chancel from the nave, the sanctuary extending some 12ft. farther east. The church contains seating accommodation for 600 worshippers, and a choir for about 30, with organ chamber, small morning chapel, and vestry, and in the basement there is a heating chamber. The roofs are open and boarded, and the walls are plastered, with stone dressings. The exterior of the church is faced with coursed Swanage rubble, without the usual dressings to quoins, &c., in soft stone, and the roofs are to be tiled with a dark colour red tile. Messrs. Jenkins are the

builders, and the architects are Messrs. W. H. Mitchell, Son, and Gutteridge, of Portland-street, Southampton.

THORNHILL, SUNDERLAND.—A new church and schools which have been erected in Burn Park-road, Sunderland, by the United Methodists, were opened on Wednesday. The buildings are in the Perpendicular style. The facings are of Pateley Bridge rock-faced blockers, with Blaxter stone dressings, all the window openings being heavily mullioned and traceried. At the corner a tower with a copper spire and vane rises 83ft. The church consists of a nave, clerestory, aisles, transeps, and chancel, and an end gallery over the entrance porches. Its seating capacity is for 520 adults. The nave arcades are worked in Denwick freestone. The pulpit base is in the same material, the upper part being of Austrian oak. The chancel is raised three steps above the nave level, and has an Austrian oak reredos screen. The choir seat ends and front screens are of the same material. The organ console will be placed in the centre of the chancel, the organ itself being divided, one half at each side. The roof is of pitch-pine, open-timbered, with chamfered hammer-beam couples. The seats, screens, and gallery front are also in pitch-pine. A stained-glass memorial window, with the "Ascension" as subject, has been placed in the chancel, and one of the transept windows is also of stained glass, representing St. John, St. Peter, and St. Luke. These windows have been designed and executed by Messrs. Atkinson Bros., Newcastle-on-Tyne. The school, which is recessed from the main road by two front classrooms, has accommodation for 300. The buildings, which have cost about £7,600, have been designed by, and the work carried out under the supervision of, Mr. J. Ezra Miller, F.S.I., and Messrs. Wm. and T. R. Milburn, joint architects, the contractor being Mr. W. B. Cooper, and the clerk of works Mr. R. F. J. Carter.

WAVERTREE, LIVERPOOL.—At the Municipal Offices, Dale-street, Liverpool, a Local Government Board inquiry has been held by Mr. A. G. Mallet into the application of the Liverpool Corporation for sanction to borrow £26,000 for the erection of public baths on land in Picton-road and Glynn-street, Wavertree. Mr. W. R. Court, the engineer and chief bath superintendent to the corporation, exhibited his plans, explaining that the buildings were to be of a substantial character, and would contain a men's swimming-bath 75ft. by 35ft., a women's swimming-bath 50ft. by 27ft., and private baths.

WOLVERHAMPTON.—On Thursday in last week the new workhouse erected at New Cross, Wolverhampton, was opened by the chairman of the board of guardians. The site occupies about fifty acres of land. The contract for the buildings amounted to £156,870, and this is exclusive of the cost of furniture, roadmaking, and boundary walls, nor does it include professional fees. The site occupied by the buildings is about six acres, and provision is made for 1,246 inmates, 20 nurses, and 60 other officers—a total of 1,326. The buildings are fitted up with maple wood floor blocks, mosaic tiled corridors, Doulton fireplaces, and electrical appliances in every room. Mr. Arthur Marshall, of Nottingham, whose design was selected in competition, is the architect, and the contractors were Messrs. T. Fish and Sons. The building was illustrated by a double-page perspective in our issue of Dec. 8, 1902.

Mr. William Moberley died on Friday at his residence, Hill View House, Woodsetton, Coseley, after a few days' illness. The deceased, who was a well-known brick manufacturer, with extensive works near Wolverhampton, had been a member of the Coseley Urban District Council since its formation, and for several years previously was a member of the old local board. He leaves a widow and family.

A Gill memorial wing has been added to the cottage hospital at Tavistock. The addition provides ten extra beds—making twenty-five beds in all—besides a laundry, drying chamber, and nurses' quarters. Mr. H. J. Snell, of Plymouth, was the architect, and Mr. John Kelly, of Horrabridge, the builder.

At Tamworth Church on Thursday afternoon the Bishop of Lichfield dedicated a stained-glass window in St. George's Chapel to the memory of the late Rev. Brooke Lambert, M.A., of Greenwich, and vicar of Tamworth from 1872 to 1878. The window contains four figures, representing St. George, St. Nicholas, St. Lambert, and St. Martin.

PROFESSIONAL AND TRADE SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—On Saturday last the members of this society made an excursion to Dartmouth to visit the new Naval College buildings now in course of erection. The President (Mr. A. S. Parker, A.R.I.B.A., of Plymouth) entertained the party to luncheon, those present being Mr. Aston Webb, R.A., president of the Royal Institute of British Architects; Messrs. Charles Cole, vice-president; James Crocker, Exeter; E. Coath Adams, C. King, T. K. Kittell, B. P. Shires, Plymouth; O. Ralling, J. A. Lucas, C. J. Tait, S. Dobell, J. H. Shearer, Harbottle Reed, hon. secretary, Exeter; Otho B. Peter, Llanneaston; N. G. Bridgman, Paignton; W. H. May, A. E. Lethbridge, R. A. Mill, H. Watts, S. R. Griffin, W. W. Hitchens, H. R. Shires, A. N. Tucker, Plymouth; A. J. Adams, C. H. Varcoe, Devonport; C. Cole, W. J. Halls, and P. S. Shrimpton, Exeter; and A. Y. Rooke and G. P. Saul, Plymouth. In addition to the above members there were present the contractor for the new College buildings, Mr. Hill, of the firm of Higgs and Hill, London; Mr. Wallis, clerk of the works; Mr. Hill, Admiralty clerk of the works; and Mr. Cousens. Under the guidance of Mr. Aston Webb, the new Naval College was then inspected. From a large plan Mr. Webb described the general scheme and the purposes to which the various sections were appropriated. The main buildings, to cost upwards of £400,000, were generally at the roof level, and one of the wing towers is erected, but the central portion, which includes a dominating tower, is not up to its full height. Wide-jointed red brick, with Portland stone dressings, gives a warmth to the composition, the main façade being about 700ft. long. The accommodation is for about 300 cadets, with quarters for officers and staff, and a residence for the captain.

LIVERPOOL ARCHITECTURAL SOCIETY.—This society will inaugurate on Monday next its 56th session, when, in the rooms in Harrington-street, the President, Mr. John Woolfall, F.R.I.B.A., will deliver his opening address. During the term several papers of important bearing are to be read, and it should be marked that at the meeting of March 7 Mr. G. Gilbert Scott is to read a series of "Notes on the Liverpool Cathedral"—notes which will be accompanied by sketches and drawings.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Arrangements have been made for the following papers to be read at the ordinary meetings of the Institute next session:—Nov. 16, "Le Trésor de Cnide et les Monuments de l'Art Ionien à Delphes," by Monsieur J. T. Homolle; Dec. 14, "The Royal Victoria Hospital, Belfast; Its Inception, Design, and Construction," by Messrs. Wm. Henman and Henry Lea, C.E.; Jan. 18, 1904, "Architecture in Lead," by Mr. J. Starkie Gardner; Feb. 15, "The Bacteriological Disposal of Sewage from Isolated Buildings," by Professor Frank Clowes, D.S.C.; March 14, "Plaster Decoration," by Mr. J. D. Crace; March 28, "Electric Generating Stations," by Mr. C. Stanley Peach; April 18, "The Statues of Wells Front, with some Contemporary Foreign Examples of Sculpture," by Mr. E. S. Prior; May 16, "The Planning of Collegiate Buildings," by the Rev. J. B. Lock, M.A., Bursar of Gonville and Caius Coll., Camb.

THE SANITARY INSTITUTE.—A provincial sessional meeting of the Sanitary Institute was held at the University, Birmingham, on Saturday. About 150 members attended from London, Ireland, and various provincial centres. Dr. Alfred Hill presided, and dealing with the subject set down for discussion, the treatment of sewage, spoke of the progress made in that department of sanitary science during the past thirty years. Professor Bostock Hill, of Birmingham, read a paper in which he pointed out that in the two modern methods of sewage disposal—land treatment and bacterial purification—the underlying principles were the same. Bacterial systems had arisen through a proper understanding of nature's methods in dealing with waste matters in the soil. Good results were only possible in land treatment when land suitable in quality and ample in quality could be obtained. An important advance had been made by the utilisation of bacteriological methods in connection with land treatment instead of utilising precipitation, as was formerly done. The selection of a system depended upon the particular

circumstances in each case. Success at one place was no guarantee of success in others. Mr. J. Edward Wilcox, M.I.C.E., of Birmingham, contributed a paper in which also stress was laid upon the impossibility of successfully treating all kinds of sewage by similar methods. Dr. Rideal (London), Dr. Fosbrooke (Worcester), and Messrs. Lowcock (Malvern), Scott-Moncrieff (London), and A. J. Martin (London) also took part in the discussion. Visits were paid by those in attendance at the conference to a new crematorium at Perry Bar, and to the works of the Birmingham, Tame, and Rea District Drainage Board at Tyburn.

CHIPS.

An organ, built by Messrs. Hele and Co. of Plymouth, was dedicated at Chirk Parish Church on Thursday in last week.

The Ipswich Town Council have just completed the purchase for £6,577 of a large portion of the late Mrs. Byles's estate in St. Helen's. It is well wooded and hilly, has an area of about 11 acres, and will form an additional open space, to be known as Alexandra Park. A further sum of £1,422 will be expended in widening the various streets that abut on the park and estate, the remainder of which is being laid out for building.

An organ, built by Messrs. Norman and Beard of Norwich and London, was opened on Friday at St. Columba's Presbyterian Church, Smithdown-gate, Liverpool.

The death is announced of Mr. Arthur Jot Barlow, architect, of 48, Edward-square, Kensington. The deceased was elected an Associate of the R.I.B.A. in 1880.

Plans for the reconstruction of the Gaiety Theatre, Ayr, which was partially destroyed by fire, were passed by Ayr Dean of Guild Court on Friday. The plans show some improvement on the interior of the building.

The Bishop of Lincoln on Saturday afternoon opened a new church at Gosberton Chough, near Spalding. The building, which has been erected at a cost of £1,300, will accommodate 120 worshippers and is from designs by Messrs. W. Bucknell and J. N. Comper, of Westminster. The church has been given the name of SS. Gilbert and Hugh.

The tablet to the memory of Mr. F. C. Penrose F.R.S., the erudite surveyor of St. Paul's, is now in course of preparation, and it will be shortly fixed in the crypt of St. Paul's Cathedral.

As a memorial to the Rev. J. Fowler Tanner, for twenty-four years the rector of Chawleigh, a new pulpit has been placed in the church. This has now been erected by Mr. Harry Hems, of Exeter, and is of oak, hexagonal in shape, carved and designed to correspond with the old oak screen. The dedication service was conducted on Thursday evening in last week by the Bishop of Exeter.

The foundation-stone of St. Margaret's Hall, which is to be erected at Castletown, near Sunderland, as a memorial to the late Col. C. J. Biggs, was laid on Saturday. The hall will be 60ft. by 27ft. and will seat 500 persons. The cost will be £1,300. Messrs. Henderson and Hall are the architects.

The gas and electric-lighting committee of the Aberdeen Town Council have appointed Mr. Samuel Milne, assistant gas engineer, as gas manager, in room of Mr. Smith, who has retired, at a commencing salary of £350, with yearly increases of £25 until it reaches £500.

Sir George Newnes, Bart., M.P., has offered to erect, on a prominent site in the Valley of Rocks road, a Congregational church, furnish it, and complete the gift with an organ. The site purchased by Sir George is practically given, he accepting only a nominal sum.

A quarter of a century has passed since the Arch-bishop of York, then vicar of Kennington, S.E. was raised to the Episcopal Bench as Bishop of Lichfield. As a thank-offering his Grace has erected a western tower to the new church of St. Andrew, Bishopthorpe, the parish in which the palace is situated. The dedication service took place on Tuesday, and at the same time there were dedicated three stained-glass windows, which have been placed in the church as memorials of the late vicar Canon Keble, and a peal of bells. The new church was built four years ago from the designs of Mr. C. Hodgson Fowler, F.S.A., of Durham. The tower which has now been added has cost £1,600. It is 64ft. in height, and is crowned by a battlemented parapet. The west window is of three lights with foliated tracery, and in the belfry are four bells. The builders were Messrs. E. Bownd and Sons, of Stamford and Hull.

Mr. J. Fletcher Moulton, K.C., M.P., has been elected president of the Junior Institution of Engineers, in succession to Colonel Edward Rabel C.B., R.E.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—M. C. R.—K. L.—J. N. L.—O. F. and Co.—G. C. M.—W. A. F.—N. F. L.—F. W. and Co.

"BUILDING NEWS" DESIGNING CLUB.

S. J. WEARING. (The slight discrepancy amounts to "Solo" being twice first and three times second instead of once first and four times second, while "All British" was four times first and twice second instead of five times first and once second. The difference does not alter the award.)—W. KING. (If the school plan works out too large for the sheet at eighth scale use sixteenth of an inch scale for the plans, keeping to the larger scale for the elevations and sections. A porter's or secretary's office is not wanted.)—J. PERKINS. (The preparation room is for lecturers to make ready in. The balance room is for the instruments and appliances to be kept in. Blocked-in walls means walls washed in solid. No description other than what is put on the drawing is required.)

Intercommunication.

QUESTIONS.

[12359].—Model Farm.—Can any of your readers inform me, through the medium of your paper, of the whereabouts of a model farm homestead of about 200 acres, erected recently within 50 miles of London?—L. M.

REPLIES.

[12007].—Electrical.—"Bell Fitting," by F. C. Allsop, 1902; "Internal Wiring," by H. M. Leat, 1899;

"Electric Lamps and Lighting," by J. A. Fleming, 1899; ditto, by J. E. H. Gordon, 1884. Probably stocked by B. T. Batsford, of High Holborn, W.C.—REGENT'S PARK.

[12008].—Normandy.—The assumption that a pleasant as well as economical trip may be taken by a chance visitor to the Channel Isles in the adjacent coast of Normandy is correct. The Jersey Eastern Railway Company have as a connection a French steamer, the *Cygne*, of some 60 tons, and capable of carrying about 250 passengers, plying daily between Gorey and Carteret. This route was opened about nine years ago, and deserves to be popular. The average sea passage is about an hour and a half, and Gorey is less than half an hour's ride by rail from St. Helier. There is a lovely bay at Gorey, standing boldly out into which, and perched upon a steep rock, is the Medieval castle known as the Chateau de Montorgueil. Its stern towers frown down upon the straggling street below, and for hundreds of years have bid a bold defiance to any possible invader from the opposite and by no means distant shore. The latter, north-east of Gorey, may be distinctly seen in fair weather. The time the steamer starts varies daily with the tide, and is given monthly in the local time-tables. It is as well to start from St. Helier by an earlier train than the boat one, as the Castle is well worth an hour's visit. Through return tickets are singularly moderate in cost. One may book any day from St. Helier to Carteret (Normandy) and back (available for a month) for 7s., second class rail and first class on steamer; whilst third class returns (for a like period), with liberty to stop over at any intervening station, are issued from Jersey's fair and lively little capital, to Cherbourg for 9s. 2d., and even as far as Caen for 12s. 1d., or should one prefer to remain at Cherbourg and return home from there direct to Southampton, a single through third (St. Helier to Cherbourg) only costs 6s. 3d. This ticket frees the traveller second class rail in Jersey (the island knows no "thirds") and second class on the steamer. It may be remarked that third class railway travelling in Normandy is rather crude. There are only wooden seats in the carriages, and no windows, save those over the doors. Thus, although by so doing one loses the charm of being in close touch with such local peasantry as may be travelling, it is, maybe, best to book second, these latter being exceedingly comfortable coaches. The cost second between St. Helier and Cherbourg is 8s. 6d. single, 12s. 10d. return, these tickets permitting first class travelling upon the Jersey railway as well as on the steamer. There are trains between Carteret and Cherbourg (three or four daily each way); the time taken averages three hours. Station-masters and all officials connected with the line are most polite; they scarcely glance at the tickets *en route*, and make no objection to the rambler staying so long as he wishes at any little station the immediate neighbourhood of which he may be desirous to explore. Saturday to Monday return tickets are issued between St. Helier and Carteret and *vice versa* (second class) for 5s. These facilities, given fine weather, offer a delightful little trip to those whose time is limited. There are two large hotels at Carteret and a small one. The latter I do not recommend. Of the former, the Hotel d'Angleterre is perhaps the best; it is charmingly situated, one front having verandahs and bedrooms overlooking the river, near to the spot where the latter's fresh water flows lazily into the sea. The catering is all that can be desired (6s. 6d. a day, *en pension*, inclusive of capital order at lunch and dinner). The handrail to some circular stone steps leading down from the main building to the courtyard in this hotel might be mistaken for rusticated woodwork. It is of cement, and a clever example of what may be done in this way in the latter material. The village is well sheltered from the winds by a headland to the north, known as Cape Carteret, and the sands cover a vast expanse; indeed, I never saw finer. Originally a mere fishing hamlet (long celebrated for its lobsters and turbot), numerous residential houses have recently been erected there. One of them is a sculptor's studio, wherein right clever work is being done by its owner, inspired, as he no doubt is, by the continual murmur of "the sad sea-waves," which perpetually wash the shore at the base of the cliff whereupon his atelier is built. The latter is a quaintly-conceived castellated, low, rambling stone building—just what an artist innocent of all architectural training might be expected to erect. Its exterior decoration takes the form of well-modelled sculpture in red terra-cotta; while nude maidens, rising from ocean foam, are cleverly painted in recessed panels. The 13th century church at Carteret is small, and, save its spire, seems almost buried in a graveyard chock full of shrubs and flowers and those ornamental iron crosses that are such common features in French rural God's acres. The edifice itself contains a striking rood-beam and carved Calvary. The beam is of Renaissance date, and does not run straight across, but takes an ogee outline on both sides, thus raising the cross itself well aloft. It consists entirely of boldly-conceived connecting carved scrolls, painted and gilded, of a character known in the cabinet-carving trade as *Cabriolet* work. Near the railway station a small new church is in progress, and is now ready to take the roof. It consists simply of nave and chancel; the walls of local blue limestone, with Caen stone dressings. Blocks of the latter are built up from the ground on both sides at intervals from east to west, suggestive of being ultimately work-d (as masonry is so commonly done in France) in *en vaulting* shafts to carry that kind of groining so common in old work in churches in Normandy and the adjacent Channel Isles. It was instructive here to notice the derrick in use for lifting and swinging the masonry into place. It is of the simplest construction, evidently planned and put together by the united efforts of some village wheelwright and smith, at small outlay of labour and material, but admirably adapted for the comparatively light work it has to do. Half-an-hour's shady walk along a tree-lined road brings one to Barneville-sur-Mer (although, as a matter of fact, the village is fully a mile away from the sea itself). The fine old Norm. church here has a tower at the east end of the south aisle of fortress-like strength, terminated with singularly shady machicolations. The exterior of the edifice is built of very small walling stones; these have recently been very much pointed with white mortar. This, unfortunately, gives the venerable fabric—at a little distance—the effect of an almost new structure. The Late Norman arcades, like the vaulting shafts, are surrounded by well carved capitals of the period, and are worthy of careful attention. Just outside the village, situated due east of the church, raised upon a high well-

wooded mound, and approached by successive flights of steps, is a tall and well executed Calvary of dark Finistère granite, the highly creditable work (some 30 years ago) of Mons. Hernet, the clever sculptor of Lannion in Brittany (to whose excellent work I referred in "Lannion: The Land of Great Stones," BUILDING NEWS, Oct. 30, 1902). Around the tall (monolith) shaft is entwined, its whole length, a broad band or scroll of inscribed copper. Upon the high sand dunes facing the sea in the neighbourhood of this village, quite a number of handsome villas have been recently erected, but the speculation has not proved a success, and only a few of them at present are occupied: the position, facing west, being so very much exposed. It is at La Haye du Puits that the railroad branches off, due north to Cherbourg, and east to Caen. These places are too well known to be referred to in these notes. If, however, the wayfarer finds himself at the former (stay at Marcel Vallet's Hotel de Paris, 10, Quai Alexandre III., six francs a day pension—exclusive of a demi-bottle of wine to lunch, and another at dinner); it is instructive, just at the present juncture, to compare the fine equestrian statue of Napoleon I., which stands boldly in the open space facing the sea, and near to the cathedral, with the confessedly disappointing model, ascribed to the late Alfred Stevens, which so many of us have recently seen in place, surmounting Wellington's memorial in St. Paul's Cathedral. The Cathedral of the Holy Trinity at Cherbourg, it may be remarked, is noteworthy for its Flamboyant tracery, its flying buttresses, its crocketed gables, and for its still more ancient saddle-back tower, crowned by the inevitable emblem of Peter's and mankind's instability in the shape of a weathercock. At St. Paul's we have seen a charger, of heavy Norman type, with a not very pleasant near hind leg (as viewed from the south aisle), and a dwarfed rider of the jockey type, who seems to lack proportionate length of thigh and body—possibly because of the foreshortening brought about by its elevated position. Further, why England's greatest military commander should grasp his charger's mane, and the reason the latter's tail should lash, is not altogether in evidence. At Cherbourg, we find Napoleon by far the best mounted of the twain; both horses are in almost exactly the same identical position, save that at Cherbourg, in spite of the exceptionally exposed position, the tail hangs in repose. The rider looks keenly across the sea towards England, pointing thereto with open hand, as if eager to clutch it. The difference, therefore, in the respective right hands of these two great generals is that whilst Wellington grabs at his horse's mane, Napoleon, more ambitious, appears to "go for" the British Main itself! But, to get back into rural Normandy again. Dotted over the whole face of the land are quite a multitude of interesting old churches, the majority of Norman or 13th-century date. The latter generally possess saddle-back towers (of which type the one at Brookthorpe, in Northamptonshire, may be quoted as an excellent example of about the same date). These towers are almost invariably crowned by a copper personification of a good old chanciere. At Le Haye-du-Puits, already mentioned, besides the old saddle-back towered church near the railway station, there is a good one in the midst of the village of Later character, and boasting of two western spires. Extensive and well-preserved remains also exist upon the outskirts of a moated chateau, its tower now a workshop, whilst the rest of the place is more or less desecrated. Now separated by a road is the "Donjon," an isolated, ivy-clad tower, a visit to the grim interior of which suggests many terrible associations. Curiously, as I sat, recently, in a humble hostel, almost beneath the shadow of this early keep, silent record as it is of Medieval terrorism. I chanced upon Samuel Taylor Coleridge's inimitable lines:—

"He prayeth best, who loveth best,
All things both great and small,
For the dear Lord who loveth us,
He made and loveth all."

If, in the Middle Ages, the proud owners of that once fair and noble castle had been guided by sentiments such as these lines convey the poor devils who, year in and year out, have from time to time rotted within those thick, almost windowless walls, might have had a much better time of it than they actually did. With these reflections I close.—HARRY HEMS.

During this week two statues have been placed on the new west façade of Hereford Cathedral, which has been built from designs by Mr. J. Oldrid Scott, and was illustrated in this journal on January 2 of this year. They represent St. Ethelbert and St. Thomas of Hereford, and are the gifts of the Duke of Newcastle and Miss Surtees Allnutt, of Hereford. They have been designed and executed by Mr. Fincher, sculptor, of Peterborough. They are partly reproductions of the mutilated effigy of King Ethelbert which is placed on a pedestal against the pier on the south side of the sacristy, and of the small figure of Sir Thomas de Cantelupe, which forms one of a group of mutilated figures over the tomb of Sir Peter de Grandison against the north wall of the Lady Chapel.

Roman Catholics of Small Heath, near Birmingham, who had hitherto worshipped in a workshop at Green Lanes, opened on Sunday their new school-chapel at the corner of the Coventry-road and Oldkuow-road. Space has been reserved on the Coventry-road side for a commodious church. Meanwhile the upper story of the school will be used as a chapel. There is seating accommodation for 300 worshippers, and 200 children can be taught on the ground floor. The architect is Mr. Percock, of Colmore-row, Birmingham.

Mr. W. R. Herring, C.E., engineer to the Edinburgh and Leith Corporations Gas Commissioners, has had his salary raised by £300 to £1,500 a year, in respect of his services in connection with the erection of the new gasworks at Granton, and on the understanding that he will continue to occupy his present post for a period of five years.

WATER SUPPLY AND SANITARY MATTERS.

ASHTON-UNDER-LYNE.—The sewage disposal works which have been constructed by the corporation of Ashton-under-Lyne were recently opened by the mayor. Before the completion of this undertaking the effluent of the sewers was discharged into the river Tame in a raw state. The works are on land about 45 acres in extent, on Plantation Farm, in the borough of Dukinfield. The bacteria beds are 56 in number, and each is about one-twelfth of an acre in area, with a working depth of about 4ft. For dealing with storm-water there is a set of nine filter-beds, with a total area of about an acre and a half, and a working depth of about 3ft. The roughing and precipitation-tanks are intended to be worked continuously, and are capable of containing about one and a third of the daily dry-weather flow, which is estimated to be 1,237,000 gals. The filtering medium in the bacteria-beds is composed of rough clinkers, brickbats, and fine clinkers, the coarsest layer being at the bottom, and the finest at the top. It is intended to work these beds in cycles of eight hours each per day, and under this system they will be capable of dealing with about 2,700,000 gal. every 24 hours, or a little more than two and one-sixth times the daily dry-weather flow. The cost of the undertaking has been £88,000. Messrs. Underwood Brothers were the contractors.

GLASGOW NEW SEWAGE PURIFICATION WORKS.—An important step in the progress of the drainage scheme of Glasgow was marked by the inspection of the Western District Sewage Works, which took place last week. The drainage area of the city is divided into three sections, each distinct from the others, with separate works for the disposal of its sewage. The first of these, authorised in 1891, and doubled in extent in 1901, comprises about eleven square miles, one-half being within the city, and the remainder in the landward district of the county of Lanark. The works for the treatment and disposal of the sewage of this area are situated at Dalmarnock, and the drainage is collected and conveyed there by a main sewer constructed at the cost of the Caledonian Railway Company. The second section was authorised in 1896, and includes the municipal area on the north side of the river, not provided for in 1891, the Burghs of Partick and Clydebank, and intervening parts of the Counties of Renfrew and Dumbarton, the whole extent being 14 square miles. The works for the disposal of the sewage derived from this area are situated on the river bank at Dalmuir, about seven miles below Glasgow. The third section, authorised in 1893, comprises the whole of the municipal area on the south bank of the river, the Burghs of Rutherglen, Pollokshaws, Kinning Park, and Govan, as well as various residential and rural districts in the counties of Lanark and Renfrew. The extent of this section is 14 square miles, and it may be enlarged by the inclusion of the Burghs of Paisley and Renfrew. The works for the disposal of the sewage of this area will be situated on the river bank at Braehead, about one mile eastward from Renfrew. For the collection and disposal of the 97 million gallons of sewage within this divided territory there will be constructed thirty miles of sewers, varying in size from 2ft. 6in. in diameter to 10ft. The principal features of the western scheme are the construction of an outfall sewer to convey the drainage of the higher levels of Glasgow and Partick to the works at Dalmuir; the construction of an intercepting sewer to collect the drainage of the lower levels of the city, the construction of an intercepting sewer to collect the drainage of the lower levels of the burgh of Partick; and a third intercepting sewer to convey to the Dalmuir Works the drainage of the burgh of Clydebank. The Glasgow and Partick intercepting sewers will be pumped into the outfall sewer at Partick Bridge, the lift being 37ft. The pumping engines, three in number, are of the triple-expansion inverted marine type, with plunger pumps, each capable of raising 11,250 gallons per minute, or 16 million gallons per day. Steam is supplied to these engines by four boilers, working at a pressure of 160lb. per square inch. The Clydebank intercepting sewer will be pumped at Dalmuir, the lift being 21ft. The smaller engines at Dalmuir will be of the centrifugal type, and power for the sewage treatment plant will be transmitted by electricity. The Sewage Committee have resolved to adopt at Dalmuir and Braehead the same method of sewage treatment as that which has for the last seven years been in successful use at Dalmarnock, with this exception, that the sludge presses, which by the compulsion of the situation of Dalmarnock works have been employed there, are to be dispensed with, and the liquid sludge carried out to sea. The western outfall sewer has now been constructed; the Partick and Clydebank intercepting sewers are virtually finished; the Glasgow intercepting sewer is being vigorously advanced; the Partick pumping-station is nearing completion; the precipitation-tanks, dock, wharf, and outfall works at Dalmuir are constructed; and the sludge-tanks, pump-house, machinery, and other works are sufficiently advanced to warrant the hope that the greater part

of the sewage derived from the western area will be undergoing purification during the course of next year.

TODMORDEN: THE GORPLEY WATERWORKS.—The Todmorden Corporation is constructing a waterworks at Gorpley, and when it is completed the present reservoir at Ramsden will be transferred to the Rochdale supply district. Gorpley Clough is only two miles from the centre of Todmorden, but provides a gathering ground of 720 acres. The new reservoir will have a capacity of 120,000,000 gal. At top water-level it will be 15½ acres in extent, and there will be a maximum depth of 76ft. When full the surface will be 845ft. above sea level, while the collecting area runs up at one point to 1,172ft. The amount of supply available in the driest weather will be about 690,000 gal. per day, exclusive of the compensation water. The full width of the embankment dam will be 924ft.; its height above the lowest foundation will be 116ft., and above the bed of the stream 88ft. Two stone "toes" prop up the foot of the embankment on each side, so as to give stability to the earthwork in the event of flood. The core of puddled clay is 20ft. thick at the bottom, and tapers off to 6ft. at the top. The inner side of the dam will be faced with stone to a depth of 15in. The by-wash, to carry off the surplus water, is of masonry and concrete, 15ft. wide. The supply is drawn off by means of a valve-tower at the opposite side of the dam to the by-wash. From this tower the water will pass in a 12in. pipe under the embankment into a tunnel which leads to the five filter-beds. The line of 15in. pipes from the tank to Rochdale-road, a length of about one-and-a-half miles, has already been laid. These pipes will in time be coupled up to the existing mains, which will be purchased from the Rochdale Corporation by the local authority. The work was begun about May, 1900, and the time fixed for its completion is four and a half years. The plans were prepared by Mr. G. F. Deacon, M.I.C.E., of Westminster, while Mr. J. H. Parkin, A.M.I.C.E., is acting as resident engineer for the corporation. The contract has been let to Mr. B. Lumb, of Todmorden, for £49,000.

THE TALLA WATERWORKS FOR EDINBURGH.—The members of the Edinburgh and District Water Trust paid an official visit of inspection on Friday to the Talla works portion of the scheme for bringing into the city the additional supply of water which was entered upon eight years ago. There are at present over a thousand men engaged all over the works, and some two-thirds of that number are working at the Talla. The visitation of the Trust was therefore directed on this occasion to what has been going on at the source of the new supply and to seeing for themselves the progress of the work during the past year. The visitors travelled from the Caledonian Station in Edinburgh right up to the Talla works over the contractor's railway, and they were met there by Mr. W. A. Tait, the engineer of the Trust, who conducted the company over the works and explained the various operations. On arriving at their destination the party saw the cut-and-cover work which makes the aqueduct leading to the tunnels and pipes which convey the water to the city. They were afterwards shown the measuring-room, through which all the water will pass into the city from the reservoir, and Mr. Tait explained the manner by which, through screens and other means, nothing offensive will be allowed to pass into the aqueduct. It was explained that the greatest height of the embankment from the bottom of the trench which is to dam the water will be 124ft., and of that 37ft. has to be finished. This trench has been carried about 80ft. below the original surface of the ground, and the highest point is 91ft. The reservoir to be constructed will supply 3,000,000 gallons per day, equal to the total storage which the Trust has at present for the whole supply of the district. Among those present at the inspection were Mr. Massey, burgh engineer; Mr. W. Carstairs Reid, C.E.; Mr. Wm. Black, superintendent of works; and Mr. Sculley, surveyor of the Water Trust.

The parish-hall, Faversham, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. Pearson-Gregory, of Harlaxton Manor, has given a carved oak screen to the parish church of Harlaxton, South Lincoln. It was designed by Mr. J. Oldrid Scott, F.S.A., and executed by Messrs. J. E. Elwell and Sons, of Beverley.

The Higher Grade School, Greenock, was formally opened on Friday. The new school, which has been erected and equipped at a cost of over £20,000, consists of two buildings, one of three stories, and another separate building of two stories. The main structure fronts Dampier-street and Trafalgar-street, the smaller building fronting Wellington-street. There is accommodation in the school for 968 pupils.

LEGAL INTELLIGENCE.

THE HOUSING OF THE WORKING CLASSES ACT.—At Lambeth County-court, on Wednesday, in the course of the case of "Carr v. Richardson," Judge Emden made some observations on the working of the Housing of the Working Classes Act, 1890. The plaintiff, who was the weekly tenant of a house on the canal bank, New Church-road, sought to recover from his landlord, a builder, £5, for damages caused by the fall of a ceiling. It was alleged that the defendant was liable to do the repairs to the house, and that he had been guilty of negligence in not carrying them out. The plaintiff had gone into occupation of the premises in April, 1902, and the accident happened on June 5, 1903. His Honour observed that the plaintiff could not base his claim upon negligence. It was then alleged on behalf of the plaintiff that the defendant had been guilty of a breach of the warranty of fitness for habitation which the law requires. Reference was made to section 75 of the new Housing of the Working Classes Act, 1890, which provides that in any contract made after August 14, 1885, for letting for habitation by persons of the working classes a house, or part of a house, there shall be implied a condition that the house is, at the commencement of the holding, in all respects reasonably fit for human habitation. It was submitted that this enactment rendered the defendant liable, and that, even assuming he was not cognisant of the state of repair of the premises in 1902, he became liable on April 29, 1903, when he was informed that the ceiling was defective. His Honour, however, non-suited the plaintiff. In giving judgment, he said that the Act did not go nearly far enough. As the law now stood, poor people, who must needs find shelter somewhere, entered premises which might seem to be all in order at the commencement of the holding; but if any defect made itself known subsequently, they were entirely helpless. The fact was that persons who became landlords of this class of property endeavoured to make as much out of it as possible without doing anything themselves. The Act should be amended. Making these observations, however, he did not wish to disparage the defendant, whose evidence he had not heard. Judgment was given for the defendant, but without costs.

IN RE WILLIAM TAYLOR, MOSS SIDE, BUILDER.—At the Salford County-court on Monday, Mr. Acton supported an application for the discharge from bankruptcy of William Taylor, who was formerly in business with his father, Charles Taylor, at Moss Side, as joiner, builder, and property repairer, under the style of Charles Taylor and Son. According to the Official Receiver's report, the applicant was made bankrupt in September, 1891. The partnership liabilities at that time were estimated at £2,853, but the proofs actually admitted and probable claims not yet admitted amounted to £2,933. The partnership assets, so far as they had not been assigned to creditors wholly or partly secured, were estimated to produce £1,828, but they only realised £140 9s. 9d. The great difference was mainly accounted for by the fact that the debtor valued certain equities of mortgaged properties at £1,626, and they turned out to be entirely valueless. Only £93 18s. 4d., therefore, was available for distribution, and a dividend of 4½d. had been paid on proofs for £2,554 7s. It was alleged that the debtor had committed several offences under the Bankruptcy Acts, but, taking all the circumstances into consideration, the Judge thought that justice would be met if he granted Mr. Taylor his discharge, suspending it for two years. He granted the discharge, therefore, on those terms.

THE LIVERPOOL TIMBER FAILURE.—At the recent meeting of creditors of Messrs. Lighthound, Rigby, and Co., timber merchants, of Liverpool, substantial assets were reported (mainly consisting of margin over securities) of the Oakhill Park building estate near Liverpool, which Mr. Charles Latham, the senior partner of the firm, had purchased and developed in conjunction with Mr. W. A. Thorburn, who was to have half the profits and to manage the estate. At the Lancashire Chancery Court, Liverpool, on Tuesday, before Mr. W. F. Taylor, the deputy of the Vice-Chancellor, Mr. J. Rutherford applied, on behalf of the Bank of Liverpool, as second mortgagees of the Oakhill estate for £19,000, for the appointment of a receiver of the rents and profits of these properties. On behalf of Mr. Thorburn the claim was put forward that, subject to the various advances made on the property, he was entitled to a full half-share of the profits, and he preferred to pay in to an account the whole of the rents and profits of the properties, pending the trial of the action. Mr. Rutherford demanded and urged the right of the Bank to have an independent receiver appointed. The Deputy Vice-Chancellor decided that the application was well founded and made the order asked for. It was agreed that Mr. Eshelby (Harwood Banner and Son) should be appointed receiver.

The new town-hall at Oundle is to be opened on Wednesday next by Lord Lilford.

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ILLUSTRATIONS.

BOARD SCHOOLS AT BRIGHTON.—XXVII. AND XXVIII. PALL MALL.—CENTRAL LIBRARY, HAMMERSMITH.—LANGWICH LODGE, NOTTS.—CHAPEL AND SCHOOL AT SEVEN KINGS.—THE HALL, PARKWOOD, HENLEY-ON-THAMES.—NEW LIBRARY, CASTLEFORD.—HALL FURNITURE FROM THE CONTINENT.

Our Illustrations.

BOARD SCHOOLS AT BRIGHTON.

THESE schools were designed for the now defunct school board for Brighton and Preston U.D., and were carried out in collaboration with Messrs. Thomas and Gilbert Simpson, the surveyors to the board. In view of the tendency of the new educational authorities throughout the country to economise, the buildings were executed for a fraction under 6½d. per foot cube, including playgrounds and boundary walls, and the interiors were finished with English glazed tile dados throughout the corridors and classrooms. Elm-grove school is interesting as having been planned with one large hall for the joint use of three departments, the peculiar configuration and rapid slope of the site permitting the evolution of a special type of plan. Both buildings were erected in a satisfactory way by Mr. P. Peters, of Horsham. The walls are faced externally with picked stocks and Lawrence's red bricks. The roofs are covered with Broseley tiles. The illustrations are from sketches made on the spot by Mr. Raffles Davison, and exhibited at the Royal Academy this year. The architect is Mr. John W. Simpson, of Verulam Buildings, Gray's Inn, W.C.

NOS. XXVII. AND XXVIII. PALL MALL.

This building was erected by the Wilkinson Sword Company, Ltd., who have their show-rooms, offices, board-room, &c., on the ground floor, and a wide oak staircase leads from the ground floor to the basement, the front portion of which is used as a showroom. The entrance to the three floors of offices and the three floors of bachelor's chambers above is in Pall Mall, the whole now occupied by the War Office as offices, and are served by an electric lift made by the Otis Company. All the rooms are warmed by hot-water, and hot water is also provided for the lavatories. The front is executed entirely in Portland stone, roofed with thick Westmoreland green slates. The elevation to St. James-square is in red brick and Portland stone; the red facing bricks, which are 18in. by 2in. by 4½in., were specially made for the job. The contractor for the works was Mr. J. Carmichael, of Wandsworth, and Messrs. J. McCulloch and Co. executed the carving to both fronts. The whole of the work was executed from the designs and under the superintendence of Mr. F. E. Williams, A.R.I.B.A. The drawings which we reproduce to-day were hung at the Royal Academy this year.

HAMMERSMITH PUBLIC LIBRARY.

This plan in its main arrangement is exceedingly like the design which was placed first in the recent limited competition, and in the location of the chief rooms is identically the same. In order to get height for the public reading-rooms, which are 16ft. high in this design, the rear part of the

buildings behind the connecting corridor on the first floor are kept as low as possible without impairing the efficiency of the lending library. By this contrivance the cube, to save expense, was minimised, and the advantage of top lighting for the newspaper-room, as well as the boys' room and ladies' room, is obtained, while the borrowers' space is perfectly lighted in front of the indicators. The reference-room books are arranged in three tiers to the rear, thus avoiding carrying this bookstore over the lending library stack-room below. The committee-room, which is of the stipulated size, has a lavatory, &c., attached, which is important, this room being intended for the use of the librarian as his office. The borrowers' hall is arcaded, as indicated on the plans. The caretaker's rooms are to the rear over the reference books stack-room and tower, which contains the private staircase, so arranged as to be available as an emergency staircase for the public in case of fire. The materials specified are red brick and Portland stone, and green slates for the roofs. The design placed first was illustrated in the BUILDING NEWS for Aug. 28, and Mr. H. T. Hare is its author. The accompanying design is by Mr. Maurice B. Adams.

LANGWICH LODGE, NOTTS.

THIS house, situated about midway between Mansfield and Worsop, has been built for the Duke of Portland's agent, on the site of an old house of no architectural interest, very inconveniently arranged and somewhat dilapidated. The position of the former building decided that of the present one, with its aspect due south; and the domestic offices on the north and west sides. The foundation is on solid rock, and the ground slopes down to a lake in front of the house, this inclination giving the suggestion and affording the facility for the terraced arrangement of the garden, which is in process of being carried out. Croquet and tennis lawns have been formed at the east side of the house, with a rose garden, pergola, and shady walks beyond, and there are some very fine old trees. The new building occupies less ground than the former one which was demolished, but it provides considerably more accommodation. That on the ground floor will be seen on the plan, and there are large cellars. On the first floor are five bedrooms, three dressing-rooms, day nursery, schoolroom, linen-room, and bath-rooms, &c., and on the second floor eight bedrooms, boxrooms, and bathroom, &c. The house is faced with red bricks of a quiet colour, with Anston stone dressings, and green (Buttermere) slates, the woodwork being painted white. The staircase and principal doors on the ground-floor are mahogany, and the floors of narrow pitch-pine boards with "pavodilos" joints. The walls of the hall, staircase, and drawing-room are panelled, and these rooms have ornamental plaster ceilings by Messrs. Garvie and Sons. The walls of the kitchen, lavatories, and bathrooms, &c., are lined with blue and white Dutch tiles by Messrs. Martin, Van Straaten, and Co., and those of the scullery and larder, &c., with white tiles. The house is lighted by acetylene gas, and partly heated by water, on the low-pressure system. "Rational" grates are used throughout, and the chimneypieces are of 18th-century style. The furniture of the principal rooms and bedrooms is chiefly old, most of it being of the Chippendale and Sheraton periods, with some earlier pieces, and many old paintings and prints, &c. Mr. Eastwood, of Worsop, Notts, was the builder, Mr. Hellis the clerk of works, and Mr. Louis Ambler, F.R.I.B.A., of London, the architect. The cost of the house was about £3,000. The existing outbuildings and stabling, &c., were extensive, and have been altered to suit the present requirements, this and the garden work having been carried out by the Welbeck estate workmen from the architect's designs.

PRIMITIVE METHODIST CHAPEL, SEVEN KINGS, LONDON, E.

THIS chapel is to be built of red pressed facing bricks, with stone dressings, green Westmoreland slates being used for the roof. There will be an open ornamental timber roof in the interior. The windows are to be glazed with leaded lights. There will be seating accommodation for 400 persons in the chapel, and 300 children in the schools. A minister's residence adjoins the chapel. Mr. H. Ascough Chapman, A.R.I.B.A., Prudential Buildings, Leeds, is the architect.

THE HALL, PARKWOOD, HENLEY-ON-THAMES.

THIS house has been erected on the estate of Parkwood, about 3½ miles from Wargrave and

Henley-on-Thames, as a country residence for the owner, Mr. Charles S. Henry. The work was carried out by Messrs. John Botttrill and Sons, of Reading, as general contractors. The architect is Mr. Wm. Flockhart, F.R.I.B.A., New Bond-street, London, W. The interior finishings of the hall shown in this illustration, and of the other principal rooms (except the drawing-room), are panelled in oak and other hardwoods, and have been executed by Mr. J. S. Henry, of Old-street, E.C. These two firms have carried out their work in a way which does them the greatest credit. The lower portion of the hall fireplace is executed in Ham Hill stone, and the upper part in gauged and rubbed brickwork in diminishing courses. This drawing was shown at the Royal Academy this year. We gave a view and plan of Parkwood in the BUILDING NEWS for July 24, 1903.

CASTLEFORD LIBRARY: SELECTED DESIGN.

THIS library design was awarded first premium in the late competition with 124 competitors, Mr. Butler Wilson being the assessor. It is proposed to be built of terracotta, and the roof covered with dark green Westmoreland slates. The chief point in the plan is the position of the librarian's office, from which point he will be able to supervise the different rooms. Mr. G. H. Vernon Cale, of Birmingham, is the architect.

HALL FURNITURE FROM THE CONTINENT.

IT would be somewhat difficult to exactly allocate the correct dates to these pieces of Elizabethan or Stuart furniture, though they resemble in a few of their characteristic details some well-authenticated pieces of a like kind. They are all now in Continental galleries; but may have come originally from Scotland, showing how eminently traditional the work of their time was, and herein remains much of its interest. These pieces are eminently suggestive and adapted to present-day uses.

CHIPS.

On Saturday afternoon, the new vicarage at St. Paul's Church, Royton, Rochdale, was formally opened. The building stands on the site of the old one. It is of red brick, with white stone dressings, and adjoins the churchyard. It has cost about £2,000.

At the last meeting of the urban district council of Ichen, near Southampton, the sanitary committee recommended the payment of the final amount due to Mr. F. Osman, of Southampton, in respect to his contract at the outfall works. The vice-chairman, Mr. Hayward, in moving the adoption of the report, said that the contract worked out at £3,739 17s., and including the breeze used the amount was £11,000.

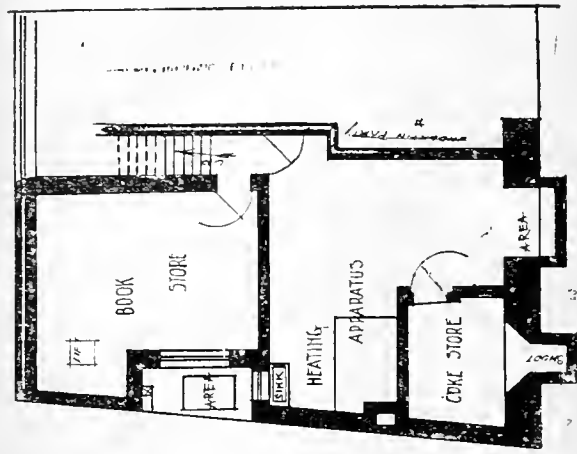
A faculty has been granted in the York Consistory Court to the vicar and churchwardens of Ulrome, near Hull, to build a new upper part to the tower of the church, a porch on the south side of the nave, and to fix a clock in the tower with three skeleton faces.

Mr. F. W. Pomeroy, sculptor, of London, has been commissioned by the Scottish Associations of New South Wales to execute a bronze statue of Robert Burns for erection in the Sydney Domain on a site to be given by the State Government.

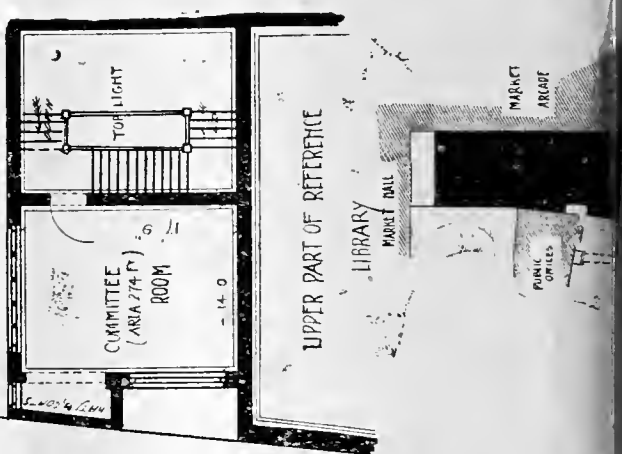
Last week saw the completion of the widening of Cadzow Bridge, in the centre of Hamilton, which carries the leading thoroughfare of the town over the ravine through which the rivulet of Cadzow makes its way to the Clyde. The bridge, which was built seventy years ago, consists of three arches, each 60ft. span, and the top of the parapet wall is about 60ft. above the bed of the burn. Eight feet have been added to each side of the bridge, and massive parapets built of Dumfriesshire old red sandstone.

The work of laying the storm-water sewer from the Police-station at Sevenoaks, through Seal Hollow-road and St. John's, to discharge into Greatness Mill Ponds, is being rapidly pushed on. The work will be finished before the winter. It will cost some £4,500.

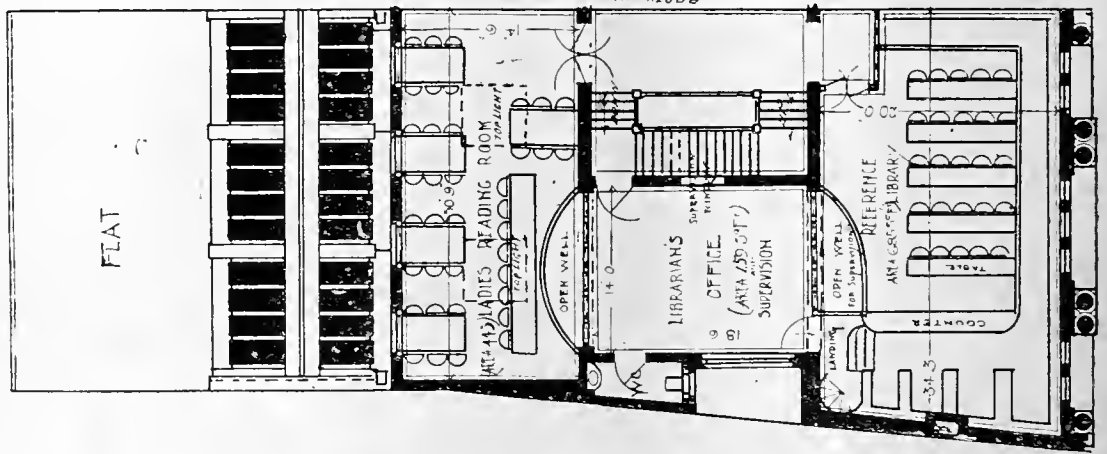
On the Latchmere Estate, Battersea, three, four, and five-room tenements—with a few small houses—have been erected by the Housing and Works Committees of the Borough Council. When the building on the estate is completed, there will be in all 173 houses, with accommodation for 315 families, or about 2,000 people. Every tenement is fitted with kitchen, copper, bath, and sink, and has its own little piece of garden. The houses are brick-built, the heads and sills to the windows and the canopies over the entrances being of granolithic. The whole of the cost, amounting to £105,000, will be met out of the rents.



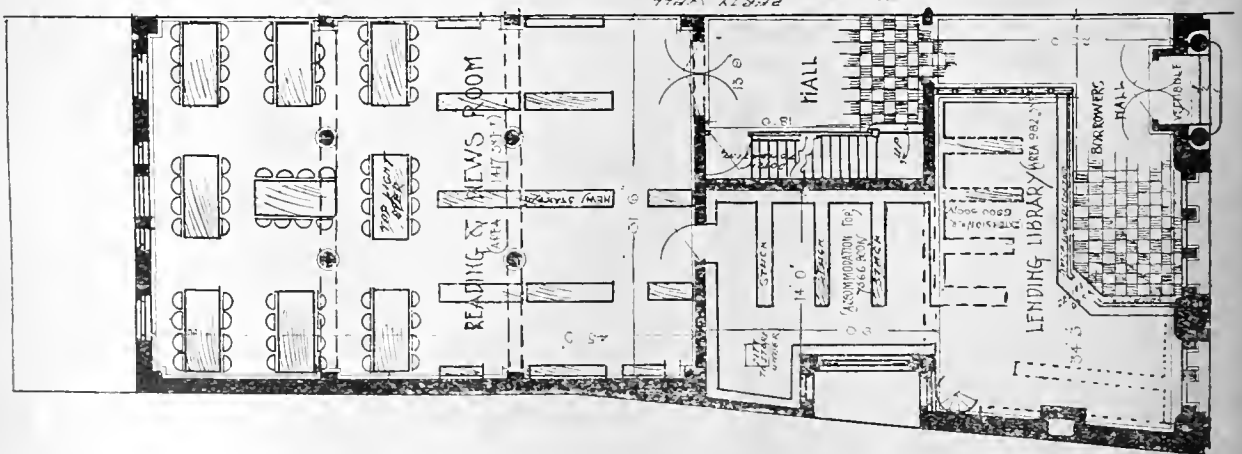
BASEMENT PLAN



UPPER PART OF REFERENCE



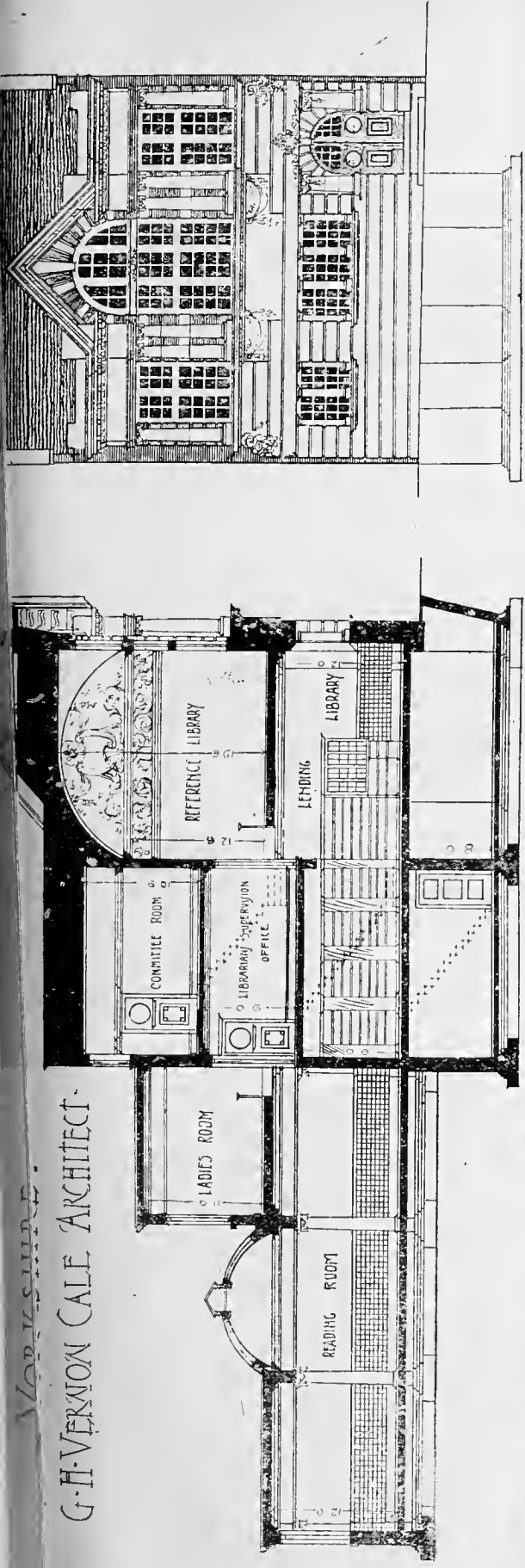
FIRST FLOOR PLAN



GROUND FLOOR PLAN

W. J. H. H. H. H.

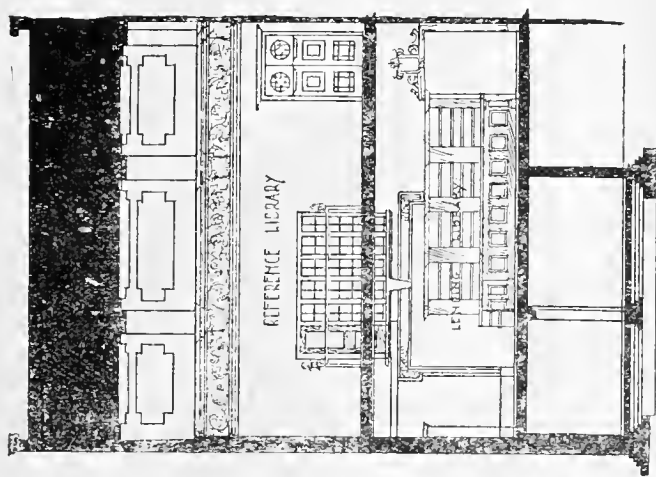
G. H. VERNON CALE ARCHITECT.



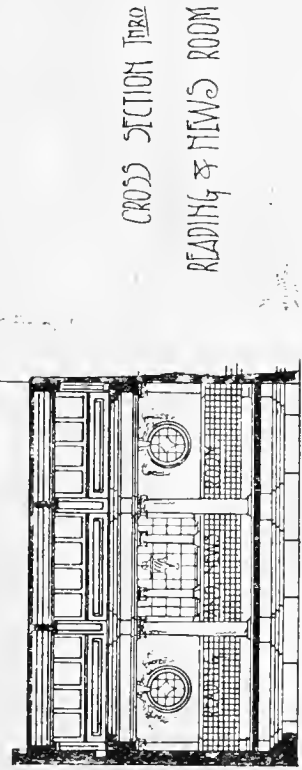
LONGITUDINAL SECTION

ELEVATION
TO
CARLTON STREET

SELECTED DESIGN.



CROSS SECTION THROUGH
LENDING & REFERENCE

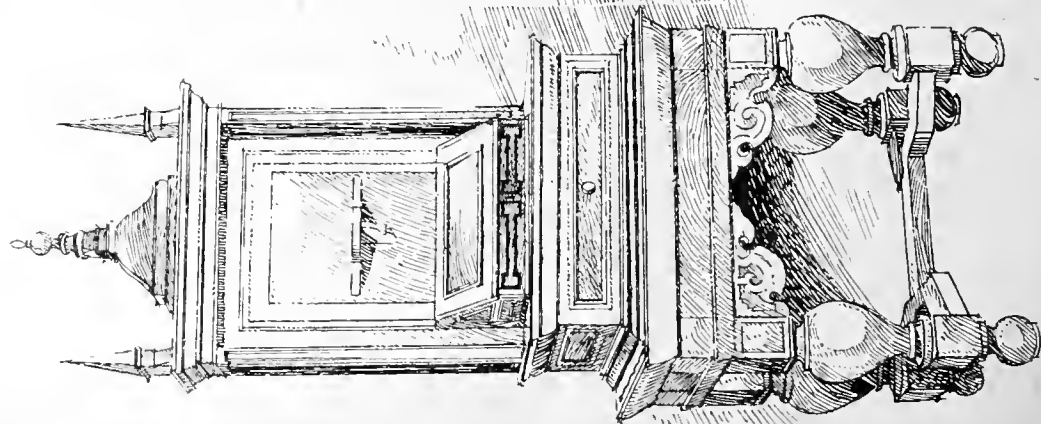


CROSS SECTION THROUGH
READING & NEWS ROOM

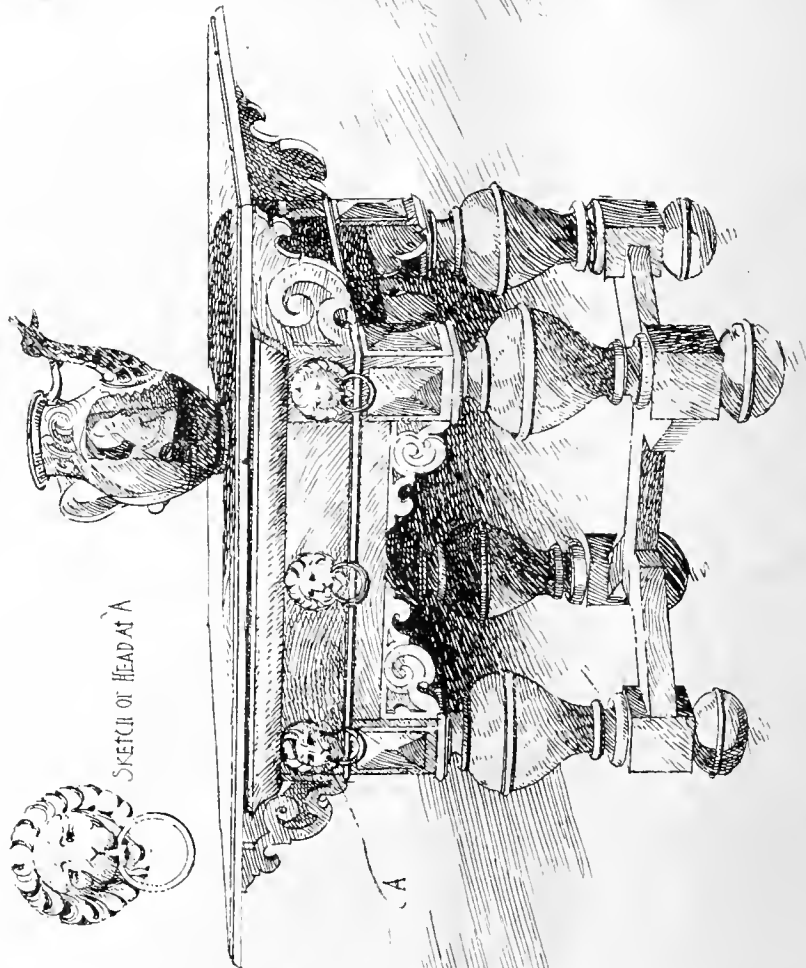


SCALE

HALL FURNITURE FROM THE
CONTINENT



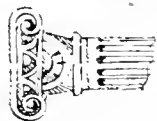
OAK CABINET OR SIDEBOARD



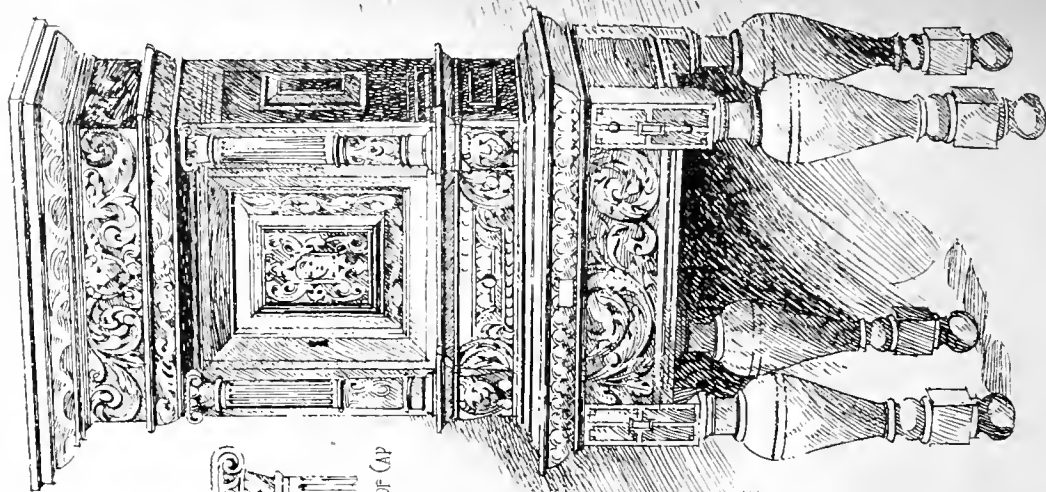
CARVED OAK TABLE



SKETCH OF HEAD AT A



DETAIL OF CAP



CARVED OAK CABINET

Our Office Table.

A RETURN has been made, by order of the House of Lords, showing from Oct. 1, 1892, to Dec. 31, 1902, the extent of land acquired by local authorities under the Small Holdings Act, with the date of such acquisitions and the parish or parishes in which the land is situate; the sum for which the land was purchased, or the term and rent for which it was hired; the amount spent on the adaptation of land for small holdings; the number and total acreage of small holdings sold, with the amount of purchase-money; the number let and their acreage, with the yearly rent and terms of letting and the number and total amount of the advances made under the Act. During the period of somewhat over ten years with which the return deals, eight county councils in England and one in Scotland have acquired land under the Act. The extent of the land acquired in England was 569 acres, including 181 acres by the Lincoln (Holland) County Council and 147 acres by the Worcestershire County Council. Only 47 small holdings, with an acreage of 164, have been sold, 32 of them in Worcestershire; while 166, with an acreage of 373, have been let. In the county of Ross and Cromarty 83 acres have been acquired, and have been purchased by 25 buyers. The average price given by local authorities, omitting transactions in London, was £36 per acre, the cost varying from £14 in Ross and Cromarty and £23 in Cambridgeshire to £70 in Devon; and £2 per acre has been spent on the adaptation of the land.

The R.I.B.A. examinations of the present autumn will be held as follows:—The Preliminary Examination, qualifying for registration as Probationer R.I.B.A., on Nov. 3 and 4. Applications must be sent in on or before Saturday in next week, Oct. 10. The Intermediate Examination, qualifying for registration as Student R.I.B.A., on Nov. 3, 4, 5, and 6. Applications must also be sent in on or before Saturday, the 10th inst. The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., from Nov. 13 to 20 inclusive. Applications must be sent in on or before Saturday, the 24th inst. The testimonies of study, &c., with the necessary fees, must accompany the applications, all of which must be addressed to the Secretary R.I.B.A., at the offices of the Institute. Examinations qualifying for the office of district surveyor in London (pursuant to the provisions of the London Building Act 57 and 58 Vict. c. ccciii. s. 140) and of building surveyor under local authorities will be held by the Royal Institute on Oct. 22 and 23, 1903. Applications must be sent to the Secretary R.I.B.A., 9, Conduit-street, W., on or before Thursday next, Oct. 8.

The syllabus has been issued of the new Manchester School of Architecture, an addition to the educational institutions of the city which has been called into existence by the joint arrangements of Owens College, the Municipal School of Technology, the Municipal School of Art, and the Manchester Society of Architects. The appointment of Prof. S. H. Capper as director of the new school has been already announced. Prof. Capper's career began at Edinburgh University, where he took first-class honours in classics. Thence he went to Heidelberg, and afterwards he took a special course of architectural study at the Ecole des Beaux Arts, in Paris. Returning to Scotland, he practised for some years the profession of architecture in Edinburgh, and was appointed lecturer at the University and examiner for the Master of Arts degree in art history and archaeology. Seven years ago Mr. Capper went to Canada, where he held at the McGill University in Montreal, a similar position to that which he has now taken up in Manchester. The work of students in the School of Architecture will be carried on partly at Owens College, partly at the Municipal School of Technology, and partly at the Municipal School of Art, and the syllabus has been arranged, in consultation with Prof. Capper, by a committee upon which Mr. J. W. Beaumont and Mr. Paul Ogden represent the Manchester Society of Architects. This new School of Architecture will provide Manchester with educational opportunities which it has not hitherto possessed. Prof. Capper's students will have the opportunity of proceeding to the degree of the Victoria University and taking honours in architecture, just as those at Liverpool had under Prof. F. M. Simpson before the partition of the colleges.

By way of introduction to the work of the school Prof. Capper has arranged to give a series of free popular lectures at Whitworth Hall during October and November, the subject being "History in Architecture." A first-year course has been mapped out for students who intend to take the degree of the Victoria University in the Honours School of Architecture, and the inclusive fee for the full course has been fixed at eighteen guineas. There are, in addition, certain special courses at lower fees. It will not be attempted at Manchester to supersede that side of training for professional practice which is only fully gained by practical employment in offices and works. The university course is intended chiefly to provide for a thorough grounding in the principles upon which professional practice is ultimately based.

A WELL-ILLUSTRATED account of the London County Council's housing schemes is contributed to *Public Works* by Mr. G. P. Knowles, P.A.S.I., surveying assistant in the Housing Section of the Architect's Department. Few people have any idea of the magnitude of the work the London County Council is doing, and doing—thanks mainly to the energy and skill of its architect, Mr. W. E. Riley—with a thoroughness and energy that assuredly mark out a future for it of usefulness and importance that it is hardly possible to over-estimate. It may very well be the work of the Housing Department of the L.C.C. to rebuild half London before the present century has expired, if we can once tax ground values, and give the municipalities powers to provide dwellings for those who are just as much the "working classes" as its present *protégés*, and quite as much the victims of the jerry-builder and the ground-landlord.

A LARGE party of German municipal and official authorities, representative of all the States of the German Empire, connected with the Central Bureau in Berlin, which deals with the question of the housing of the working classes, commenced a round of visits in England with a view to obtaining information from the various municipal and private organisations dealing with the housing problem. The party which is under the leadership of Dr. Von Edderger, Dr. Professor Oldrecht, and Herr Brederick, started from the offices of the London County Council, after obtaining particulars of the Council's housing schemes. They drove through the slums of Whitechapel, and after visiting the site of the London County Council's Boundary-street scheme, went on to the Whitechapel Rowton House. Here they were received by Sir Richard Farrant, the deputy chairman, and Mr. S. J. Earle, the surveyor, and were by them conducted round the building. Later in the afternoon the party paid a visit to Bromley-street Workhouse. The party proceeded to Birmingham yesterday (Thursday), and visited the Bournville estate. In the evening they departed for Liverpool. After a day spent in that city the party will proceed to Port Sunlight and Glasgow.

PROFESSOR LOW, whose name is so well known as an author of books on drawing, has invented some drawing appliances which certainly deserve the attention of architects, surveyors, and engineers. The set-squares, protractors, and scales which Messrs. Longmans, Green, and Co. have sent us bear out all the prospectus says about them. The set-squares are framed in the usual way, and are made of white tough wood covered with a thin facing of celluloid which leaves off short of the drawing edge, say, about $\frac{1}{16}$ in. or so. By this means the drawing edge of the instrument or square stands above the paper, leaving a clear space to the extent of $\frac{1}{16}$ in. This slight elevation is not enough to interfere with the accuracy of linear delineation; but it reduces the chances of ink blobs, blotting, and smearing.

EVERYBODY who draws knows the trouble caused by the ordinary set-square, especially in tracing, and more particularly when the drawing traced is not perfectly flat. Prof. Low's set-squares are made in two kinds. The A variety has transparent celluloid edges so that the user may see through and ascertain the exact position of his square with regard to the lines under its edge, or B, the kind which has hard ebonyised wood edges just as in the ordinary mahogany-framed square. The celluloid facing, in either case, is smooth and white, covering both sides of the squares. The material adds to the strength of the framing, and the squares are exceedingly light and convenient to manipulate. When dirty they can be easily washed, and, what is of moment, they are very in-

expensive, the largest sizes, 8 in. and 12 in. respectively, for the 45° and 60°, being only 2s. each. The adjustable protractor set-square is, of course, made out of the solid, one side of the plate of white celluloid being engraved so that in constructing or measuring angles every degree from 0° to 90° may be accurately determined. The objection to celluloid for scales is its high coefficient of expansion or contraction with variation of temperature, and cardboard scales are not durable. The Low scales now before us are made of wood, covered with transparent celluloid to the thickness of $\frac{1}{1000}$ part of an inch, making them very strong, and not liable to alteration by atmospheric conditions. They are made 9 in. and 12 in. long, and are divided into foreign and English scales available for every kind of drawing and measuring off plans. The set of three is sold for a shilling. Tee-squares are about to be introduced on the same principle as the set-squares.

THREE interesting publications have just reached us from Messrs. Verity's, Ltd., of London, Manchester, &c. Two consist of small books, one devoted to electric stoves for warming purposes, of the type frequently employed, consisting of special incandescent lamps placed before a suitable reflector. Several varieties of these stoves are shown in an attractive booklet. The other small book is a collection of photographs of electric light fittings of pleasing design and appearance. They are modern in character, and should form a useful addition to an architect's collection of price-lists. The third and more important publication is a catalogue of electric light fittings, consisting of 160 pages, containing several hundred designs, ranging practically through every possible style of decoration, from simple brackets, pendants, and electroliers of a few shillings in value to elaborate designs running into many pounds. All three books are nicely got up, and no doubt a postcard to Messrs. Verity's, Ltd., will insure the delivery of the three books to anyone interested.

MESSRS. DENT AND HELLYER, their present premises being required by the London County Council for the Holborn-Strand improvements, are removing their business, established over a century and a half ago, to 35, Red Lion-square, and 75, Theobald's-road, W.C., where, we are sure, they will enjoy a continuance of the confidence and support deservedly extended so long. Few firms have such a time record, and none have better justified their long existence by successful determination to keep abreast of the age.

The Carpenters' Company announce their annual series of lectures on "Sanitary Building Construction" to commence next week, and we notice that the lectures are on the usual useful subjects, and that they will be of interest is guaranteed by the names of the lecturers. These lectures are preliminary to the examination held by the Company in November next, and also are primarily intended for candidates proposing to sit for that exam., but are open to others interested in sanitary matters. Tickets for admission to these lectures can be obtained from the clerk.

A COMPUTER of pipe discharge arranged like a circular slide rule has been designed by Mr. Charles Anthony, jun., M.Am.Soc.C.E. It is based on Manning's formula, $v = R^{2/3} S^{1/2} \div n$, in which v is the velocity in feet per second in the pipe or channel, R is the hydraulic mean depth, S is the sine of the inclination, and n is a coefficient having the same values as the n of Kutter's formula in most cases. The instrument can be used with equal rapidity and precision with metric or English measures. It has four concentric graduated circles, the inside and outside fixed and those between movable. The inside circle has scales for v , the next scales for R , the third for S , and the outside circle for n . The instrument is made by W. F. Stanley and Co., London.

ACCEPTANCE tests for cement were discussed at the recent meeting of the American Society for Testing Materials by Mr. E. S. Larned. It is common practice to use the average of the results as a measure of the cement's quality, and the extreme variations sometimes recorded are probably chiefly due to a difference in the manipulation of the samples rather than to any variation in the quality of the cement. It is necessary to choose between taking the mean of the results of a number of individual samples, or mixing all the samples together thoroughly and testing the

mixture. Mr. Larned believes that the latter plan is the better, and he also endorses the decision of the U.S.A. Board of Engineer Offices, appointed to establish requirements for cement, to judge a shipment by the best results obtained, and not by the mean of all the results. In respect to tests for soundness, Mr. Larned emphasises the fact that in actual work the cement has an opportunity for seasoning between the time of its arrival on the work and its actual use. Moreover, when the cement is unbarrelled and mixed with sand more or less damp, it receives a thorough aëration and some hydration before it is used. On the other hand, the cement is often tested for soundness immediately on its receipt, and it is obvious that laboratory determinations under such conditions do not represent fairly the action of the cement in use.

At a meeting of the Court of the Paviers' Company on Wednesday the awards in connection with the recent competition by essays, drawings, and models on the subject of "subways or other means of placing and maintaining without interference with the surface, the main pipes and services of gas, water, and other undertakings below the carriageways or footways of cities, boroughs, and towns," were declared. Twenty-six competitors submitted essays, drawings, and models. The first premium of £105 is given to Mr. R. M. Parkinson, 93, Lincoln-road, Peterborough; the second premium of £31 10s., competitor's name at present unascertained; the third premium of £21 to Mr. P. M. Royle, A.M.Inst.C.E., 3rd Avenue, Sherwood Rise, Nottingham.

CHIPS.

The new transepts of the chapel at Harrow School, erected in memory of those who lost their lives in the South African war, will be consecrated by the Bishop of London at 11 a.m. on Thursday in next week.

The county council of Clackmannan have adopted plans and copy of report on Menstrie drainage scheme, at an estimated cost of £1,450. Mr. W. R. Copland, C.E., is to carry out the scheme, and application will be made for power to borrow £2,000. A report by Mr. Copland on the Clackmannan water supply has been remitted to the Clackmannan Water Committee to consider.

Mr. Cuthbert Brown, for the past seven years waterworks engineer and surveyor to the Bedlingtonshire Urban District Council, Northumberland, and previously on the staff of the city engineer of Newcastle-on-Tyne, has been appointed, out of 158 applicants, water engineer and borough surveyor to the corporation of Chelmsford at a commencing salary of £305, rising to £350.

At the final meeting of the Huddersfield School Board, held on Monday, the chairman stated that the 17 schools provided accommodation for 12,938 children, and had cost £179,170.

The new covered wholesale market, which has been erected by the Wolverhampton Corporation at a cost of upwards of £16,000, will be opened on Monday next by the mayor.

At the last meeting of the Bradford School Board, a site for a new infants' school at Undercliffe, containing 7,998 square yards of land, was purchased for £1,235. It was also decided that the salary of the architect to the board (Mr. W. Vaughan) be increased to £320 per annum. Application was ordered to be made to the Public Works Loan Commissioners for loans amounting to £10,877 for works at Lorne-street School, Horton Bank Top, Thackley School, and Thornton School.

The church of St. Lawrence, on Lawrence Hill, Bristol, built in 1885, was reopened last week after redecoration, the laying of a new floor of pitch-pine, and the installation of incandescent gas-lighting. The general contractor is Mr. E. Walters, of Montpellier, and the architect Mr. W. V. Gough, of Bristol.

The ceremony of laying the memorial-stones of the Wesleyan chapel which is in course of erection in Pickwick-road, Corsham, took place last week. The chapel is erected in front of the old elifise, which will be utilised in future as a Sunday-school. The new building, which is in the Gothic style, with open timber roof and traceried windows, will provide seating accommodation for 300, and will cost £1,500. Mr. Bromley is the architect, and the contractor Mr. Moore, of Trowbridge.

A firm of Glasgow accountants have issued a circular stating that Messrs. McDowall and Neilson, timber merchants, of 55, West Regent-street, Glasgow, have been obliged to suspend payment. The firm has been in existence for about twenty years, and since the death of McDowall, a few years ago, has been carried on by Mr. Neilson. The liabilities, exclusive of speculative commitments, amount to over £100,000.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Liverpool Incorporated Society. Opening Address by the President, John Woolfall, F.R.I.B.A., 13, Harrington-street. 6 p.m.

TUESDAY.—Institute of Builders. Finance Committee. 3.30 p.m. Council Meeting. 4 p.m.

WEDNESDAY.—University College, London. Introductory lecture in the School of Architecture on "Architectural Evolution," by Professor F. M. Simpson, F.R.I.B.A. 5 p.m.

THURSDAY.—Eastern Counties Master Builders' Federal Council Meeting, 2.30 p.m.; General Meeting at 3 p.m., Crown and Anchor Hotel, Westgate-street, Ipswich.

Carpenters' Company's Free Lectures. "Sanitary Arrangements of Free Buildings," by Dr. A. Wynter Blyth. 8 p.m.

THE ARCHITECTURAL ASSOCIATION.

COURSES OF INSTRUCTION IN ARCHITECTURE. The Day and Evening Schools are now in progress. Intending students are requested to forward their names to the Secretary as early as possible.

A pamphlet giving full information as to the Classes and advantages of membership may be obtained upon application to the Secretary, at 55, Great Marlborough-street, London, W.

LOUIS ANGLER, } Hon. Secs.
H. TANNER, Jun. }

The foundation-stone of a Roman Catholic church, to be dedicated to St. Hugh, was laid on a site in Earle-road, Liverpool, on Sunday by Bishop Whiteside. The church will be built at a cost of £6,000, which sum has been given by Mr. William Nelson.

On St. Michael's Day a new clock, with new chimes, adapted from one of Dr. Wesley's anthems, by Messrs. Wm. Potts and Sons, clock manufacturers, Leeds and Newcastle-on-Tyne, and being the first time used in a public clock, was set going at the parish church of Keighley.

The Usworth School Board have appointed Mr. Stephen Wilkinson, Chester-le-Street and Mosley Chambers, Newcastle, architect for the new schools at Springwell, to accommodate 500 children. His plans were placed first in a limited competition.

The chancel of St. Margaret's Church, Aberdeen, is to be completed as a memorial to the late Rev. John Comper, the founder and first rector. The architect is Mr. J. N. Comper, son of the late rector, from whose designs a chapel of St. Nicholas was added to the building some years since.

The Secretary for Scotland has appointed Mr. George A. J. Lee to be deputy keeper of the records in Scotland, in place of Mr. Matthew Livingstone, I.S.O., who retires under the age limit.

At the Guildhall, Alderman and Sheriff Sir John Knill has been sworn into the office of Master of the Worshipful Company of Plumbers, and Dr. Robert Crawford, I.L.D., and Mr. Alderman Hind into the offices of Warden and Renter Warden respectively, on re-election for the ensuing year.

A destructive fire broke out on Monday at the premises of Samuel Warburton, joiner and builder, Clifton-street, Miles Platting. The building, a two-story one, with concrete floors, was entirely burnt out, with the exception of the offices adjoining.

At a special meeting of Wolverhampton Town Council on Monday, the decision of the council in committee arranging terms with the Lorain Steel Company for the retention of the system of tramways laid by them in the borough was confirmed. The tramways committee recommended the adoption of this system on the remaining routes in the town, but the report was referred back to the committee.

The memorial-stone was laid on Friday of a new technical school which is being built in Upper George-street, Tyldesley. The school, which will include a gymnasium and library, is estimated to cost £6,000, one-half of which will be provided out of the rates and the remainder by public subscription.

Mr. Moses Dodd, formerly of Lincoln's Inn, and one of the best known agricultural surveyors in England, died last week. The deceased, who was 86 years of age, died from congestion of the lungs. He twice filled the office of Master of the Saddlers' Company, namely, in 1877 and in 1885.

St. Paul's Church, Prince's Park, Liverpool, was reopened on Sunday, after internal decoration. The work has been done by Messrs. G. H. Morton and Son, Ltd., Liverpool, under the direction of Messrs. H. and A. P. Fry, architects. There have also been extensive alterations to the organ.

A bust of the late Mr. Cecil Rhodes, which has been executed in marble at the request of the City Corporation, has reached the Guildhall. It will be placed in a prominent position in the lobby.

The deputy borough surveyor of Swansea, Mr. Walter Bond, has accepted the post of borough engineer and surveyor to the town of East London, South Africa. Mr. Bond was one of five selected out of 105 applicants, and the commencing salary is £800 a year. At present he is in receipt of a salary of £225 a year.

Trade News.

WAGES MOVEMENTS.

SUNDERLAND.—The strike among the Sunderland joiners ended on Saturday, and the men returned to work on Monday morning. The dispute had existed between the house-joiners and the master builders for fourteen weeks. The question was submitted to arbitration, and Mr. A. A. Hudson, the referee appointed by the Board of Trade, awarded that the advance asked for by the men, from 9½d. to 10d. per hour, should not be granted. This award was loyally accepted by the men.

At the instance of the Local Government Board, Mr. H. Rose Hooper, M.A., A.M.Inst.C.E., will hold an inquiry to-day (Friday) at the public offices, Egremont, relative to applications of the Wallasey Urban District Council to borrow £2,070 for the widening and other improvements of Grove-road, Wallasey, £1,510 for works of sewerage, and £590 for the provision of lavatory accommodation in Liscard village at its junction with Sea View-road.

Two stained-glass windows presented to Forsbrook Church as memorials were dedicated on Sunday. The subjects depicted are the Annunciation of the Saviour's birth to the Shepherds, the representation of Christ delivering his discourse concerning the lilies, His welcome to the little children, and His ascension into heaven. The work has been carried out by Messrs. Ward and Hughes (Mr. T. F. Curtis), of Soho, London, W.

Mr. G. J. Edmundson, of Ledbury, has been appointed surveyor to the Stourport Urban District Council.

Mr. J. Mortimer having resigned his position of surveyor and inspector of nuisances to the Tattenhall Urban District Council, Mr. McCarter, at present employed under Preesall Urban District Council, has been appointed.

The new Carnegie gymnasium which is to be erected for St. Andrew's students, and plans for which have been approved of by the University Court, is estimated to cost £3,800.

A special committee meeting relative to the housing of the poor was held on Monday at the town-hall, Newcastle-on-Tyne. A scheme was presented for the housing of the poor on Walker-road, whereby there will be provided 100 two-room houses, and 12 one-room houses, at rents varying from 2s. 6d. to 4s. 6d. per week. The committee decided to bring the proposal before the city council for approval.

Mr. Joseph Brown, builder and contractor, of Hackney, while assisting his men in loading a van with timber at King's Cross goods station on Saturday last, some of it slipped and fell on him. He sustained injuries to his head from which he died.

The work in connection with the rebuilding of the fallen Campanile at Venice has been delayed by the resignation of Signor Beltrami, who was placed at the head of affairs by the Italian Government. Meanwhile, a committee has been formed at Venice to consider the next course to pursue. This committee has been advised to appoint some competent authority on questions regarding the foundations of buildings, and to send him to Rome in order that he may examine the ancient edifices there.

An inquiry was held on Friday by Mr. W. Norton, Local Government Board inspector, relative to the application of the urban district council for sanction to a loan of £17,160 in connection with a scheme for electric lighting.

The thirty-seventh annual convention of the American Institute of Architects will be held in Cleveland, Ohio, the 15th, 16th, and 17th inst. Mr. Theodore N. Ely, of Philadelphia, Mr. Augustus St. Gaudens, Mr. John La Farge, Mr. E. H. Blashfield, and Mr. Austin W. Lord, all well known to the profession, have promised to read papers.

Owing to the neglect of the small expenditure necessary to preserve the ruins, another portion of the roofless east end of Howden parish church fell at the end of last week.

At the last meeting of the Tavistock Urban District Council a report by Mr. J. Chadwick was read, embodying a scheme for the disposal of Tavistock sewage. The cost was estimated at £3,800.

Herr A. Stavenow, general superintendent, Berlin Tramways, and Herr A. Münde, engineer, chairman State Railways, Berlin, were in Glasgow last week to study the Glasgow tramway system. They were particularly interested in the arrangements for the making and repairing of cars at the Coplawh, works of the tramway department, and also in the design of car in use in Glasgow. The tramway system of Berlin is a very large one, the number of motor-cars in use being 1,800, and the number of trailer cars 1,200.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English.....	6 10 0 "	6 12 6
Wrought-Iron Girder Plates.....	7 0 0 "	7 5 0
Bar Iron, good Staffs.....	6 5 0 "	8 10 0
Dr., Lowmoor, Flat, Round, or Square.....	20 0 0 "	20 0 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0 "	8 15 0
Best Smedshill.....	9 10 0 "	9 10 0
Angles 10s., Tees 20s. per ton extra.		

Builders' Hoop Iron, for banding, &c., £7 7s. 6d.
Builders' Hoop Iron, galvanised, £12 to £13 per ton.

Galvanised Corrugated Sheet Iron—		No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive	Per ton.	Per ton.	Per ton.
gauge.....	£11 15 0	£12 0 0	£12 0 0
Best ditto.....	12 5 0	12 10 0	12 10 0
Cast-Iron Columns.....	£6 10 0 to	£8 10 0	
Cast-Iron Stanchions.....	6 10 0 "	8 10 0	
Rolled-Iron Fencing Wire.....	8 0 0 "	8 5 0	
Rolled-Steel Fencing Wire.....	6 5 0 "	6 10 0	
" Galvanised.....	4 15 0 "	8 0 0	
Cast-Iron Sash Weights.....	7 12 6 "	4 12 6	
Cut Clasp Nails, 3in. to 6in.....	9 5 0 "	9 5 0	
Cut Floor Brads.....	9 0 0 "	9 0 0	

Wire Nails (Points de Paris)—
6 to 7 8 9 10 11 12 13 14 15 B.W.G.
8/- 8/6 9/- 9/6 9/9 10/6 11/3 12/- 13/- per cwt.

Cast-Iron Socket Pipes—		Per ton.
3in. diameter.....	£5 15 0 to	£6 0 0
4in. to 6in.....	5 12 6 "	5 17 6
7in. to 24in. (all sizes).....	5 7 6 "	5 10 0
[Coated with composition, 3s. 0d. per ton extra; turned and bored joints, 5s. 0d. per ton extra.]		

Pig Iron— Per ton.
Cold Blast, Lilleshall..... 105s. 0d. to 112s. 6d.
Hot Blast, ditto..... 63s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

	10cwt. casks.	5cwt. casks.
Gas-Tubes.....	67½ p.c.	62½ "
Water-Tubes.....	62½ "	57½ "
Steam-Tubes.....	57½ "	55 "
Galvanised Gas-Tubes.....	55 "	50 "
Galvanised Water-Tubes.....	50 "	45 "
Galvanised Steam-Tubes.....	45 "	

	Per ton.	Per ton.
Zinc, English (London mill).....	£28 0 0 to	£24 10 0
Do., Vieille Montagne.....	26 5 0 "	28 15 0
Sheet Lead, 3lb. and upwards.....	13 10 0 "	13 10 0
Lead Water Pipe (F.O.R. Lond.).....	14 0 0 "	14 0 0
Lead Barrel Pipe.....	15 2 6 "	15 2 6
Lead Pipe, Tinned inside.....	16 2 6 "	16 2 6
" and outside.....	17 12 6 "	17 12 6
Composition Gas-Pipe.....	16 2 6 "	16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6 "	16 2 6
Pig Lead, in cwt. pigs.....	10 16 3 "	10 17 6
Lead Shot, in 28lb. bags.....	15 0 0 "	15 5 0
Copper Sheets, sheathing and rods.....	75 0 0 "	75 5 0
Copper, British Cake and Ingots.....	59 0 0 "	59 10 0
Tin, Straits.....	118 5 0 "	118 15 0
Do., English Ingots.....	121 0 0 "	121 10 0
Spelter, Silesian.....	21 0 0 "	21 7 6

TIMBER.

	per load £10 0 0 to	£18 0 0
Teak, Burmah.....	9 15 0 "	16 0 0
" Bangkok.....	3 12 6 "	6 5 0
Quebec Pine, yellow.....	4 12 6 "	7 10 0
" Oak.....	5 0 0 "	10 0 0
" Birch.....	4 7 6 "	9 0 0
" Ash.....	4 12 6 "	8 5 0
Danish and Memel Oak.....	2 12 6 "	6 10 0
Fir.....	3 2 6 "	5 10 0
Wainscot, Riga p. log.....	2 7 6 "	5 5 0
Lath, Danish, p.f. log.....	4 0 0 "	6 0 0
St. Petersburg.....	4 0 0 "	6 0 0
Greenheart.....	7 15 0 "	8 0 0
Box.....	7 0 0 "	15 0 0
Sequoia, U.S.A., per cubic foot.....	0 3 6 "	0 3 9
Mahogany, Cuba, per super foot.....	0 0 6 "	0 0 8
" Honduras.....	0 0 6 "	0 0 7½
" Mexican.....	0 0 4 "	0 0 5
" African.....	0 0 3½ "	0 0 5½
Cedar, Cuba.....	0 0 3½ "	0 0 3½
" Honduras.....	0 0 3½ "	0 0 3½
Satinwood.....	0 0 10 "	0 1 9
Walnut, Italian.....	0 0 3½ "	0 0 7½
" American (logs).....	0 8 1 "	0 3 1

Deals, per St. Petersburg Standard, 120-12ft. by 1½in. by 11in. :—

	£22 0 0 to	£29 5 0
Quebec Pine, 1st.....	18 5 0 "	23 10 0
" 2nd.....	11 15 0 "	14 0 0
" 3rd.....	11 10 0 "	15 0 0
Canada Spruce, 1st.....	8 10 0 "	10 0 0
" 2nd and 3rd.....	8 0 0 "	9 10 0
New Brunswick.....	7 10 0 "	8 5 0
Riga.....	8 10 0 "	16 10 0
St. Petersburg.....	11 10 0 "	19 10 0
Swedish.....	9 0 0 "	10 5 0
Finland.....	12 0 0 "	19 10 0
White Sea.....	6 10 0 "	14 0 0
Battens, all sorts.....		
Flooring Boards, per square of 1in. :—		
1st prepared.....	£0 13 6 "	£0 19 0
2nd ditto.....	0 12 0 "	0 16 0
Other qualities.....	0 8 0 "	0 14 0

Staves, per standard M :—
U.S. pipe..... £37 10 0 " £45 0 0
Memel, cr. pipe..... 220 0 0 " 230 0 0
Memel, brack..... 190 0 0 " 200 0 0

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 3
Red Mansfield ditto.....	" "	0 2 4½
Hard York ditto.....	" "	0 2 10
Ditto ditto 6in. sawn both sides, landings.....	per foot sup.	0 2 8
random sizes.....	" "	£0 1 3
Ditto ditto 3in. slabs sawn two sides, random sizes.....	" "	£0 1 3

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations.....	per foot cube	£0 1 0
Delivered on road waggons, Paddington Depot.....	" "	0 1 6½
Ditto ditto Nine Elms Depot.....	" "	0 1 8½

Portland Stone, in random blocks of 20ft. average :—
Brown.....
White.....
Whit Bed. Base Bed.

Delivered to railway depot at the quarry.....	per foot cube	£0 1 5½
Delivered on road waggons at Paddington Depot.....	" "	£0 1 7½
Ditto Nine Elms Depot.....	" "	0 2 1
Ditto Pimlico Wharf.....	" "	0 2 2½

FEVRE AND CO. S. d.

Blocks Palotte Banc Franc.....	1 5	per c. ft. ex. steamers London.
Ditto ditto Banc Royal.....	1 3	d. do. do.
Ditto Euville.....	1 9	d. do. do.
Ditto Comblanchieu.....	3 0	d. do. do.
Ditto Massangis (Roche).....	2 6	d. do. do.

OILS.

Linseed.....	per tun	£19 2 6 to	£19 12 6
Rapeseed, English pale.....	" "	23 5 0 "	23 15 0
Do., brown.....	" "	22 5 0 "	22 15 0
Cottonseed, refined.....	" "	22 11 0 "	23 0 0
Olive, Spanish.....	" "	32 0 0 "	32 0 0
Seal, pale.....	" "	26 0 0 "	29 0 0
Cocanut, Cochinchina.....	" "	30 0 0 "	31 0 0
Do., Ceylon.....	" "	25 7 6 "	26 2 6
Palm, Lagos.....	" "	28 10 0 "	28 15 0
Oleum.....	" "	17 5 0 "	19 5 0
Lubricating U.S.....	per gal.	0 7 0 "	0 8 0
Petroleum, refined.....	" "	0 0 5½ "	0 0 6
Tar, Stockholm.....	per barrel	1 6 0 "	1 6 0
Do., Archangel.....	" "	0 19 6 "	1 0 0
Turpentine, American.....	per tun	37 0 0 "	37 5 0

CHIPS.

The Co-operative Hall at Crewe has been reopened this week, after redecoration and repair, carried out by Messrs. Milton and Son, of that town.

The foundation-stone of a nurses' home was laid at Bearwood Hill, Smethwick, on Wednesday week. The home is being erected at the cost of the mayor, Alderman Chalvine, will be three stories in height, and will comprise 14 rooms. Mr. G. Bowden, of Smethwick, is the architect.

A new Welsh Congregational Chapel at Colwyn Bay was opened last week. The chapel is situated in the main street, with sitting accommodation for 600, and has been erected at a cost of £3,000.

A fatal accident occurred on Friday morning at the Savoy Hotel, where rebuilding operations are in progress on the Strand approach. A derrick, which was being employed in lifting an iron girder, collapsed, killing a man named Thomas Harnden and slightly injuring two others named Joseph Flitton and Robert Bleachment. Four men had been told off to hoist an iron girder by means of a hand crane, when the mast broke out of the shoe. One of the workmen managed to jump clear and escaped injury, but the others were thrown from the scaffold, a distance of about 18ft. At the inquest held on Monday, the jury returned a verdict of "Accidental death," and added a rider to the effect that they considered the erection of the crane was improperly supervised.

At the parish church of Woodbridge, East Suffolk, a stained-glass window in the north aisle has been dedicated as a memorial to the Rev. T. W. Meller, rector from 1844 to 1870, and editorial superintendent of the British and Foreign Bible Society. The centre lights have three figures—the principal writers of the Bible—Moses, writer of the law; David, the Psalmist, and Paul, the principal writer of the New Testament. Underneath is a picture of natives of different nationalities receiving the *Verbum Dei*. Some of the types represented here are the Red Indian, the Cree Indian, a Maori, Fijian, and Chinaman. The work was carried out by Messrs. Powell and Co., of Whitefriars.

The citizens of Ballarat, Australia, have decided to erect a statue to the memory of the troops who fought in the South African war. The statue is to be equestrian, in bronze, and the cost will not exceed £1,300 delivered in Melbourne. The pedestal is to be constructed locally. Designs are being received by the Agent-General for Victoria for transmission to the committee.

It is expected that the electrification by the London County Council of the tramway system on the south side of the Thames will be completed before the close of the year, with the exception of the Battersea and Wandsworth routes.

A housing scheme is about to be carried out by the corporation of Newport, Mon., at an estimated cost of £10,000. The site is in Ailesbury-street, and thirty-three buildings, each containing two tenements, will be built.

A special meeting of the Windsor Town Council was held on Monday, when a scheme for the erection of a dust destructor on a piece of waste land outside the borough, at an estimated cost of £6,000, was unanimously adopted, and it was decided to apply to the Local Government Board for permission to borrow the money.

The Belfast Trades Council announced on Monday that Mr. William Walker, secretary of the local Carpenters' Society, will contest North Belfast at the General Election in the Labour interest.

On Saturday afternoon the new hall of the Airdrie Evangelistic Association, erected as a memorial of the late Dr. and Mrs. Wilson and child, who were martyred in China during the persecution of the missionaries, was formally opened. The hall, which is seated for 700 people, has a suite of rooms, including a lesser hall adjoining. The building has been raised by public subscription, the cost being £2,800.

The Queen Victoria Memorial for Nottingham will take the form of a statue, to be erected at the north-west end of the market-place. Mr. Albert Toft, of South Kensington, has been commissioned to execute the work. Queen Victoria is to be represented in white marble in a standing position wearing her crown, and with the sceptre in the right hand and the orb in the left. The figure is to be from 9ft. 6in. to 10ft. in height on a pedestal of polished red granite 15ft. in height. Mr. Toft expects to complete the work by November of next year.

An organ is being placed in the parish church of Longthorpe, near Peterborough. Messrs. Norman and Beard, of Norwich, are the builders.

Brunswick-square, Camberwell, is to be turned into an open space for the use of the public. Half the cost is to be contributed by the London County Council and the remainder by the borough council.

The governors of the Merchant Venturers' Technical College, at Bristol, aided by a grant from the corporation of that city, recently secured for the purposes of equipping new workshops, a building in Rosemary-street, near Broadmead, formerly occupied as a co-operative. For the last few months workmen have been at work making the necessary changes in the building to fit it for new purposes for which it is intended, and these extensions have now been completed.

The new and more direct road between Eastleigh and Bishopstoke, Hants, has just been opened for traffic, and is a great improvement on the old one. The work has been carried out under the superintendence of Mr. Taylor, surveyor to the Hants County Council.

John Oakley and Sons, Ltd., have declared the twenty-first half-yearly dividend on the preference shares at rates of 6 per cent. per annum, less Income-tax, payable on and after Monday, Nov. 2.

The Duchess of Bedford on Saturday afternoon visited Watford, where she opened a new wing added to the district hospital to celebrate the King's Coronation. The new portion of the hospital includes two new wards for six beds each, offices, dental operating-room, and a dark-room for X-rays, the whole being lighted by electricity and heated on the medium-pressure hot-water system. It has cost £1,300.

At Leeds, on Saturday, was laid the foundation-stone of the first permanent parish church begun under a new church extension scheme. The Low Moor Company have presented the site, which is at Beeston Hill, in the suburbs of the city, and the edifice is to be christened the Church of the Holy Spirit. The edifice has been designed by Mr. H. Prothero, of Cheltenham, and the estimated cost is £11,000.

A new public clock has been placed in the parish church tower at Haughley, Mid-Suffolk. The clock, which was dedicated last week, has been supplied and fixed by Messrs. John Smith and Sons, of Midland Works, Derby.

The partnership hitherto subsisting between G. M. E. L. Verlyck and E. T. Dunn, architects and surveyors, Ilford, Essex, under the style of Verlyck and Dunn, has been dissolved.

In a museum attached to two almshouses at Kirk-leatham, near Redcar, erected in 1676 by Sir William Turner, Knight, Lord Mayor of London, is a carving of St. George and the Dragon out of a single block of boxwood, the work of a poor prisoner. It is valued at £2,000. It is said that this piece of carving was the cause of a wager being once laid in a dispute as to its entirety. To prove that the work was one single piece of carving it was plunged into a pot of boiling oil and allowed to remain for hours. All doubts were set at rest when it was withdrawn and found to be still complete. The prisoner who completed this marvellous piece of work used no ordinary penknife only.

New co-operative stores at Deckham, near Sheriff Hill, was opened on Friday. Mr. Edwin Bowman, of Newcastle, is the architect, and the contractors are Messrs. Raven and Hitcham, of Gateshead.

LIST OF COMPETITIONS OPEN.

Saltwood, Elham—Sewage-Disposal Scheme	3'gs.	R. Lonergan, Clerk, 11, Cheriton-place, Folkestone	Oct. 7
Rawtenstall—Free Library and Town Hall (Assessor)	£100, £50, £30	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	" 12
Harrogate—Pump-Room and Colonnade in Valley Gardens		F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	" 26
Sunderland—Additions to Town Hall	£100, £50, £25	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	Nov. 21
Wakefield—Reconstructing Cattle Market	50'gs. (merged), 25'gs.	R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pontney-lane, E.C.	(1904) Mar. 31
Glasgow—Branch Library for Parkhead District		Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	—
Liverpool—Cotton Exchange (Local Architects)		Peter Brown, Sec., 5, Brown's Buildings, Liverpool	—

LIST OF TENDERS OPEN.

BUILDINGS.

Goole—Public Library	Urban District Council	H. B. Thorp, Architect, Aire-street, Goole	Oct. 3
Worsborough Dale—Six Houses, Edmunds-road	J. Booth	Arthur Whitaker, Architect, Worsborough Bridge, Barnsley	" 3
Christchurch, Hants—Platform at Workhouse	Guardians	A. Druiett, Clerk, Christchurch, Hants	" 3
Netherfield—Goods Shed	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	" 3
Risca—Three Houses	Corporation	Ernest N. Johnson, Architect, Risca, Mon.	" 3
Bradford—Alterations to Lodges, Bowling Cemetery	Urban District Council	F. E. P. Edwards, A.R.I.B.A., City Architect, Brewery-st., Bradford	" 3
Swadlincote—Fire Station	Corporation	Thomas Kidd, Town Engineer, Swadlincote	" 3
Bridlington—Parade Shelter	Guardians	E. R. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington	" 3
Llanelli—Public Hall at Cross Hands	Midland Railway Co.	David Jenkins, F.R.I.B.A., Llandilo	" 3
Christchurch, Hants—Alterations to Board Room	Watch Committee	A. Druiett, Clerk, Christchurch	" 3
Carlton—Goods Shed	Lady Lumley's Foundation Governors	The Company's Architect, Cavendish House, Derby	" 3
Birmingham—Police Station, Bloomsbury-street	Bradford City Football Club	John Price, City Engineer, Council House, Birmingham	" 5
Shirecat—Pair of Semi-Detached Villas	Corporation	R. Horsfall and Son, Architects, 22A, Commercial-street, Halifax	" 5
Pickering—Grammar School	Great Western Railway Co.	John Bilson, Architect, 23, Parliament-street, Hull	" 5
Bradford—Roofing Stand at Valley Parade	H. Swayne	R. Campbell, Secretary, Belle Vue Hotel, Bradford	" 5
Carlisle—Additions to Town Clerk's Office	Shoreditch Borough Council	Henry C. Marks, A.M.I.C.E., City Engineer, 36, Fisher-st., Carlisle	" 5
Portsey—Shops and Houses	Great Western Railway Co.	R. B. Pratt, A.R.I.B.A., Town and County Bank Buildings, Elgin	" 5
Birmingham—Police Station, Bloomsbury-street	London County Council	John Price, City Engineer, Council House, Birmingham	" 5
Lochelly—Headmaster's House	Rural District Council	William Birrell, Architect, High-street, Kirkcaldy	" 5
Brighton—Repairs, 54, Old Steine	Hemsworth R.D.C.	T. Simpson and Son, 17, Ship-street, Brighton	" 5
Varteg, Pontypool—School (270 places)	Borough Council	Landowne and Griggs, Architects, Newport, Mon.	" 5
Belfast—Incorporate Maternity Hospital	Thos. Ewart	W. J. Fennell, M.R.I.A.I., Architect, 2, Wellington-place, Belfast	" 5
Newtown, Montgomery—Additions to Intermediate Schools	Campbell Gas-Engine Co.	Teather and Wilson, Archts., Andrews Bldgs., Queen-st., Cardiff	" 5
Legacy, Ruabon—Cottage	Admiralty	G. K. Mills, Secretary, Paddington Station, W.	" 6
Dartmouth—Royal Oak Inn	E. Evans Bevan	E. H. Back, C.E., M.S.A., Dartmouth	" 6
Pudsey—Shed Buildings at Union Mills	Education Committee	C. S. Nelson, Architect, Snod Buildings, 15, Park-row, Leeds	" 6
Hoxton-square, N.—Pulling Down and Rebuilding Stores	Trevelin School Board	J. Rush Dixon, A.M.I.C.E., Town Hall, Old-street, E.C.	" 6
Alnwick—Billiard Room at Mechanics' Institute	Governors	The Secretaries, Mechanics' Institute, Alnwick	" 6
Maesteg—Extension of Goods Shed	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 6
Stratford, E.—Repairing Abbey Mills Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 6
Harrington—Vicarage	Great Western Railway Co.	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	" 6
Llandenny, Mon.—Cottage at Raglan-road Level Crossing	Rural District Council	G. K. Mills, Secretary, Paddington Station, W.	" 6
Naas—Sixteen Labourers' Cottages	Hemsworth R.D.C.	D. J. Purcell, Clerk, Naas, Ireland	" 7
South Kirkby—Lodge at Hospital	Borough Council	J. Richardson, Architect, Hemsworth	" 7
Murley—Exit Staircase at Co-operative Hall	Thos. Ewart	R. Cattle and Son, Architects, Cleckheaton	" 7
Fulham, S.W.—Two Lodges in South Park	Campbell Gas-Engine Co.	Francis Wood, A.M.I.C.E., Engineer, Town Hall, Fulham, S.W.	" 7
Midhurst—Additions to Residence	Admiralty	William Buck, Architect, North-street, Horsham	" 8
Basenethwaite Halls—Rebuilding House	E. Evans Bevan	Jos. Watson, 1, Museum-square, Keswick	" 8
Halifax—Extensions to Works	Education Committee	Jackson and Fox, Architects, 7, Rawson-street, Halifax	" 8
Cwm—Five Houses and Shops	Rural District Council	Ernest N. Jackson, Architect, Risca	" 9
Walten Creek, Essex—Coastguard Station	Smithfield Club	The Director of Works, 21, Northumberland-avenue, W.C.	" 9
Pontefract—Free Library, Salter-row	Henry A. Burke	Garside and Pennington, Architects, Pontefract	" 10
Seven Sisters, Mon.—Thirty Houses	Aberystwith School Board	J. Cook Rees, Architect, Neath	" 10
Manchester—Alfred-street Municipal Schools	Management Committee	The Education Offices, Deansgate, Manchester	" 10
Shildon—House	Borough Council	J. F. Walsh and G. Nicholas, Archts., Museum Chambers, Halifax	" 10
Dowpatrick—Seven Labourers' Cottages	Parton and Harrington Breweries	Edward Nolan, C.E., Workhouse, Downpatrick	" 10
Barrow-in-Furness—Alterations to Old Municipal Buildings	North-Eastern Railway Co.	The Borough Engineer's Office, Barrow-in-Furness	" 10
Leeds—Wood Annex at Cattle Market	Electricity Committee	Fred Mitchell, Architect, 9, Upper Fountain-street, Leeds	" 10
West Hartlepool—Three Houses, Colwyn-road	Lambeth Guardians	Francis E. Boaz, York-road, West Hartlepool	" 10
Bellinamallard—Business Premises	Parton and Harrington Breweries	T. Elliott, Architect, 37, Darling-street, Enniskillen	" 10
Nantyglo—Classroom, &c.	Greenwich Borough Council	R. L. Roberts, Architect, Ahearn	" 12
Mullingar—Soldiers' Home	H.M. Commissioners of Works	A. E. Joyce, Architect, Mullingar	" 12
Bethnal Green, N.E.—Clearing Site of Electricity Works	Improvement Committee	The Borough Surveyor, Town Hall, Bethnal Green, N.E.	" 13
Letchworth—Floors at Lunatic Asylum	Town Council	J. P. McGrath, Architect, Foyle-street, Londonderry	" 13
Whitehaven—Alterations to Shakespeare Hotel	Thomas Leathes Exors	Wm. Carmichael, Architect, Parton, Whitehaven	" 14
York—Offices	Metropolitan Railway Co.	William Bell, Architect, York	" 14
Kilmarnock—Generating Station	Guardians	R. Blackwood, Borough Surveyor, Market Bridge, Kilmarnock	" 14
London, S.W.—Repairs to Relief Station, Stockwell-road	Great Western Railway Co.	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	" 14
Whitehaven—Alterations to Brow Top Beerhouse	Corporation	Wm. Carmichael, Architect, Parton, Whitehaven	" 15
Blackheath, S.E.—Depot Buildings, St. John's Park	Urban District Council	The Borough Engineer's Office, Town Hall, Greenwich-road, S.E.	" 15
Hereford—Extension of Post Office	Standing Joint Committee	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 16
Hull—Thirty-two Artisans' Dwellings, Steynburg-street	John T. Lack	Joseph H. Hirst, City Architect, Town Hall, Hull	" 17
Peebles—New Gasworks, Eschels	A. Maddison	Wm. Buchan, Town Clerk, Peebles	" 17
Embleton—Buildings at Low Nethercales	John T. Lack	Edmund Jackson, Civil Engineer, Whitehaven	" 17
Neasden, N.W.—Repairing Shed	United Building Society	R. H. Selbie, Secretary, 32, Westbourne-terrace, W.	" 19
Paddington, W.—Boiler-House at Harrow-road Workhouse	F. Eastaugh	F. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria-st., S.W.	" 20
Acton, Middlesex—Engine Shed		G. K. Mills, Secretary, Paddington Station, W.	" 22
Hereford—Shedding at Cattle Market		J. Parker, City Surveyor, Mansion House, Hereford	" 23
Portsmouth—School		Rake and Cogswell, Architects, Prudential Buildings, Landport	" 23
Ilford—Depot, &c., Ley-street		H. Shaw, A.M.I.C.E., Surveyor, Town Hall, Ilford	" 26
Portland—Additions to Police Station		The County Surveyor's Office, Shire Hall, Dorchester	" 27
Shepherd's Bush, W.—Shops and Flats, Uxbridge-road		Palgrave and Co., Architects, 28, Victoria-street, Westminster	"
Leeds—Additions to House and Stables		Mossley and Co., Estate Agents, 6, Wormwald-row, Leeds	"
Clacton-on-Sea—Residence		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	"
Harrogate—Farmhouse at Pannal Ash		Bolshaw and Stevens, Architects, 1, Princes-street, Harrogate	"
Blackburn—House		Pegg and Farrow, Architects, 7, Market-place, Barnard Castle	"
Blackburn—Cottage Homes for Disabled Soldiers		M. Call and Robinson, Architects, 7, Tacketts-street, Blackburn	"
Enfield—Twenty Workmen's Cottages		N. Millett, 72, Bishopgate-street, With, E.C.	"
Clacton-on-Sea—Detached Residence		George Gardiner, Architect, 11, Marine-parade, Clacton-on-Sea	"
Uley—Stable, &c.		Moore and Crabtree, Architects, 22A, Commercial-st., Halifax	"
Skiroast, Halifax—Two Villas		Richard Horsfall and Son, Architects	"
Pwll—Mission Church		C. A. Jones, Clymaenllwyd, Llanelli	"
Tredegar—Ten Houses		W. S. Williams, Architect, Tredegar, Mon.	"
Pontypool—Presbyterian Hall		Habershon, Fawcner, and Co., Archts., High-st., Newport, Mon.	"
Leeds— Wesleyan Sunday-School, Cardigan-lane		Dobby and Simpson, Architects, 10, Park-row, Leeds	"
Southwold—Shop and Residence, High-street		Arthur Pells, F.R.I., Architect, Beccles	"
Dewsbury—Warehouse, Wood and Bradford-streets		Holton and Fox, Architects, Corporation-street, Dewsbury	"
Bridge of Allan—Ramsay's New Sanatorium		Charles G. Soutar, Architect, 30, Whitehall-street, Dundee	"
Chelmsford—Shaft (5 ft. high)		Ernest West, Contractor, Chelmsford	"

ELECTRICAL PLANT.

Dublin—Electric Crane (100 ton)	Port and Docks Board	John P. Griffith, M.I.C.E., East Wall, Dublin	Oct. 5
Manchester—Electric Lift (5-ton)	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	" 5
Gravesend—Generating Station	Town Council	C. F. McInnes, A.M.I.E.E., Electricity Works, Gravesend	" 6
Oldham—Electric Lighting	Corporation Electricity Committee	W. Newington, Engineer, Greenhill Electricity Works, Oldham	" 8
Manchester—Telephone Pipes	Paving and Highways Committee	The City Surveyor's Office, Town Hall, Manchester	" 8
Birkenhead—Wiring Laird and Holt Schools of Art	Education Committee	William Bates, A.M.I.C.E., Cravee-street, Birkenhead	" 9
Chelmsford—Plant	Municipal Council	Morley and Dawbarn, 82, Victoria-street, Westminster, S.W.	" 19

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MODERN ARCHITECTURAL PROBLEMS.

ALTERED circumstances have considerably changed architecture and the profession. It is now more a question of erecting buildings for shelter, business, or occupation, and of designing façades to them, than of practising the art from a love of it. The fervour of the early revivalists has died away. Strawberry Hills, Fonthill Abbeys, Castles and Medieval churches are no longer erected with the enthusiasm which once prompted their builders. In our towns at least everything is essentially practical and prosaic; it is the use of the building, not its appearance, that is regarded. Questions of light and air, ample accommodation—which can only be secured by lofty building in our dense towns—are uppermost. We do not now discuss municipal regulations and building by-laws which restrict the architect in his work, but confine our attention to questions of design and construction, such as those imposed by density of area in towns, light obstruction, change of environment, new requirements of trade or occupation. A great variety of circumstances concur to render the problem of design in these days very difficult. A building which did very well fifty years ago for a city warehouse is quite out of place now; its windows are probably too small to admit sufficient light amidst lofty structures of the same class, its floors incapable of bearing the load and vibration of new methods of storage and transit, or the wear and tear of machinery. The bank or insurance office of that time would also be out of date in many of its appointments and equipments. Situated between lofty premises and surrounded by inflammable goods, its risks would be considerably heavier than when it was built. Its windows would be largely obscured by opposite or rear premises; the equipment of the interior would be inadequate for modern use. Even its architectural design is out of date, for all the careful study and detail of façade in its upper parts are obscured by the premises on either side, which are larger or more ostentatious, and throw out of scale the details of the older building. The difficulty of meeting the changed condition of modern life with forms stereotyped 300 years ago, which has been charged by many people against the Church of England, applies with equal force to our national architecture, which has shown a reluctance to break through traditional forms of building. Even now many of our best architects do not scruple in casing a warehouse constructed of steel columns and girders with red brick walls pierced by square windows of the Georgian era, with sash frames and small squares of glass to match, and with copying the charmingly quiet and reserved shop-front windows which used to line our pavements a hundred years ago. Of course, there is a certain sentiment in all this; but it goes to prove that in art, as in other things, we possess the desire to follow old forms rather than those which express the real condition of structure. In the other direction we clothe the same skeleton structure of iron and steel with the most ornate and elaborate Renaissance exteriors, indicating the opposite extreme of expression. In one case we have an almost puritanical reserve, in the other a display of architectural detail quite in the contrary direction. This is an anomaly unknown to all preceding periods;

but it represents the opposite extremes of life and taste in building. We cannot explain it in any other way. There are people who like reserve and restraint, others who prefer license and display. Both kinds of architecture are, however, stereotyped forms, which have nothing to do with structure; in fact, they both misrepresent it under modern conditions. It is one of the problems of the architect to discover a more consistent expression if he can. It may be we have no other style to offer in substitution, though they very ill express structures of the kind we have mentioned. From what we have said it is clear that design has not grown with the actual building conditions, and the external architecture is often at variance with the structure within. The structural necessities of modern building, the use of steel and fireproof floors and materials, cannot be made to yield: they will rather develop with the requirements of trade and industry, so that the difficulty of reconciling the two things will increase rather than diminish.

Let us look at a few of the points which distinguish the modern from the old. In our crowded towns there is the absolute necessity of increasing the height of our buildings, and this entails a certain loss of light, and consequent variation of our street elevations. For one thing, larger window openings are required, and the projecting features, like cornices and string-courses, must be reduced as much as possible. Here we have two variations in the design of our buildings, which we cannot overlook. Neither of them is indifferent. Each should be recognised in our crowded street architecture. Large or more numerous windows must be provided in the narrower streets, especially in commercial or office buildings, where light is of first importance, and horizontal projections must be minimised at the cost of architectural effect; the latter has been done in not a few of our recent street premises. We notice this feature in a few new buildings in the Strand—the façade of the Cecil Hotel and the chief front of the new Gaiety Theatre may be named. The cornice of the latter over the open colonnade or loggia is proportioned to the columns, and not to the whole height of façade. A flatness of effect may sometimes result from cutting down all projecting courses. To compensate for this, the architect may have recourse to breaking up his front vertically by recessing the windows or inseting them, as is very well done in the new terracotta offices at the corner of Fetter-lane, where bays with flat-canted sides are inset in the wall. The cornice and other features are kept flat.

The result of the first of these innovations—the widened window—is to reduce the wall in area, to gather it up into piers, and to form wide window bays, a mode of construction which is very generally adopted in warehouses, factories, and other premises of a commercial kind. The walls being concentrated into piers, these must naturally be made thicker. We may call such a mode of construction the Pier or Pilaster style. It lends itself well to iron or steel stanchion construction and girders. Stanchions cased in terracotta, or stone, or granite can be carried up several stories, as in the American "skyscraper," while the horizontal or floor connections would be set back from the pilasters, and would be made to look ornamental if desired. A cornice of small projection can be carried along the top or broken round each pier, and there may be a high or low roof. This is one of the modes open to the profession to work out. But the idea of a broad wall surface is dear to the architect; he likes the spaces between and above the windows to be wide, and for the window openings to appear what they are in a wall, so he prefers, with all its faults, the "hole-in-the-wall" style of sixty to a hundred years ago. The wall spaces between the

windows vertically can be made ornamental, panelled, or be set off with deep stone, cut keystones, and gauged niches. The second innovation we have mentioned, the reduction of all projections, may be found to work out more satisfactorily with piers than with flat wall surfaces. We almost dread to contemplate the appalling bareness of walls of great width and height without cornices or projections, only pierced by windows, which we occasionally meet with. The one chief good about it is that it is honest; it proclaims what it is—an unbroken wall of brick with a few light apertures, masterful and "overwhelming with the impressiveness of silence." Each of these methods of building has its advantages—the first gives the largest amount of light, the second affords the greater protection to opposite premises in case of an outbreak of fire, and in narrow city lanes and passages this is an obvious merit. Breadth of surface also is better for wall decoration. The point of most importance to decide, however is light. The necessity of greater altitude or number of stories involves also an encroachment on the right of light of opposite neighbours. Here the Law of Light steps in: it will not permit the building owner of the dominant tenement to raise his premises a height that will unduly obstruct the light of his neighbour, and if the reform in the Law of Light is passed, the dominant owner will be entitled to such an amount of light passing over the servient tenement as necessary for comfortable use and enjoyment of the dominant tenement, but he is not to be entitled to any extraordinary amount of light necessary for any particular trade or occupation. Such a restriction necessarily limits the height of buildings in certain circumstances, though what these are has not been made clear from the legal decisions. We know that in London alone the question is becoming a difficult one. In many parts buildings are erected on each side of narrow passages which seriously interfere with the light of opposite premises, but there is no law to touch them. The County Council is the only authority who can interfere. The problem is not confined to building; it concerns the architectural treatment of these structures. Should they be perfectly plain, or not? Common sense dictates that plain treatments are desirable, as any ornament is thrown away, and cannot be seen—at least in the upper part. The architect is at least wise if he confines his detail to the lower portion or story. If it is a shop or warehouse he may introduce a thoughtful and judicious treatment of his windows, which should be flat or only slightly curved in plan, as in many of the older shops. He may just give those touches of detail and ornament to his cornice and entrances which can be seen and appreciated by the passer-by; but the rest of his façade he may well leave alone, as no one can strain his neck to look up. If the building is very lofty, and peers above the surrounding premises, the upper story may be designed with special reference to being seen above the roof; the treatment can be made architectural and the profile studied, ever remembering it has to be seen from afar, not from the street below. But besides light and treatment of the fronts of such buildings, their protection against fire ought ever to be present in the mind of the architect, and this is another problem that has to be faced. The building regulations are supposed to look after this. If the party-walls are built and other details of the Act are complied with as to areas, &c., it is thought all is done that is needful. But we consider the planning and construction of our large commercial houses and establishments, retail as well as wholesale, are by no means what they ought to be. As lately pointed out in our columns, these regulations are very inadequate; they leave many of our smaller shop premises totally unprotected

internally, and anyone can escape the law by making his building a foot or so under the prescribed 250,000c.ft., and then as to exits and means of escape they are unprovided. Proprietors and customers have to be catered for, as well as the safety of those employed and the public.

The requirements are often contradictory. The owner and his customer want large, unimpeded floors for the display of goods and for showrooms, and they want commodious lifts in the centre; but those engaged on the premises or in workrooms, and who have to risk their lives in the upper stories, require provisions to be made that will secure their safety when a fire breaks out; a lift or an open staircase in the centre is the greatest danger of all. A large amount of floor-space is also a risk, and the fittings necessary for a good display of goods add to the combustible materials. The requirements against the spread of fire necessitate, of course, a limit to be placed on large floors and the storage of material, and the division of the building into fire risks or compartments that can be closed in case of an outbreak with fire-resisting doors, so as to localise any fire. These are well-understood precautions, and theoretically the conditions necessary to prevent the spread of fire and to secure the safety of the inmates are well known; but we have not seen any practical solution. If our buildings are constructed of fire-resisting materials, they are faulty in other respects. Of what use are fire-resisting floors if these are penetrated by a lift or staircase without means of protection, or if the exits from the building are in the wrong place? Then fire may break out in one building and communicate across a narrow street with another, if there are no means of effectually closing all the windows. Experts have, on paper, made it clear how to localise a fire and confine it within a manageable space; they have shown how the windows and openings can be protected, and the means of escape provided. The solution, in fact, has been attempted. One good scheme, laid down by Mr. Ellis Marsland, consists of dividing the building into compartments. Light is provided through a large lantern in the roof, lighting the various floors. Several large staircases are provided from ground floor to roof, with an elevator to each. The door openings in the compartment walls are placed in a direct line with the exits into the streets. A fire occurring in one compartment, the customer could pass through the doorways, and could make his exit in either direction. There would be nothing in the building to burn except the contents of each floor, and the well and lantern would act as a chimney for the escape of smoke. Now the compartmental mode of building by division walls would favour architectural effect. It would enable the architect to divide his long floors and rooms and corridors by walls or columns into a suite of apartments, and greater variety would be obtainable. The external staircase and lift could be turned into distinctly architectural features or towers at the ends or angles of the building, and the lantern and flat roof could also be made pleasing. All these things had no existence half a century ago—that is to say, they did not trouble the architect in his design of a building. Now they exercise a great deal of influence, and architectural design is no longer a question of the employment of the Five Orders, or the adaptation of a style simply, but it has to take into account modes of construction that are often detrimental to artistic efforts.

Planning and design do not entirely exhaust the subject. The many novel methods of construction and the use of new materials have led to a revision of the older forms and types. Take, as an instance, the introduction of "reinforced" or steel concrete. For engineering purposes, for subways and sewers, arches and bridge construction, and floors re-

inforced concrete has been largely used, and it is gradually being used in the construction of buildings, in pier and floor construction, staircases, balconies, towers, and other features. And the armoured concrete has largely supplanted brick and stone work, and other materials, like iron and timber construction. The architect who desires to bring it into use must acquaint himself with the best methods of construction, the proper position of the bars and rods of steel which have to take the tensile stresses, and the thickness of concrete. The ferro-concrete of the Hennebique system appears to be well suited for solid floor and staircase construction. It has certainly a rather bulky appearance; but the architect may, by moulding the edges of the lower beams, take away any heaviness of appearance. We have seen the system used for a large warehouse floor, in which deep cross-beams divide the floor into bays or squares of about 10ft. These beams support the floor slabs, which are continuous, and of about 4in. thick. The floor was heavily loaded, and the deflection small. The beams are reinforced by rods 1½in. diameter. One or two of these are bent, and the others straight, supported by stirrups at intervals, which take the shearing. The stress on the concrete is supposed to be uniform in all the compressed parts, and the forces in compression are in moment equal to those in tension taken by the rods. According to the inventor, the concrete does not take any tensile stress. Floors of this construction have carried considerable loads. We do not here enter into the theory of floors of this kind; but if the tensile and compressive forces are equal, the assumption is that the concrete and steel reinforcement are perfectly balanced. This plan of reinforced concrete is applied to columns and supports as well as floors; it can be used for arches and vaults. For concrete arches the steel armature is carried well into the abutments, and an armature is also carried along the extrados as well, to resist the tensile stress at the point of rupture. Thus, a double armature is used. To apply this system of reinforced concrete for architectural purposes, it becomes necessary to ascertain the stresses to which the structure is exposed, so that the steel rods or bars may be introduced where desirable. As the steel armatures are incased with concrete, a considerable latitude is allowed to the architect to mould the mass into any desirable shape. Ordinary iron and steel construction does not permit of this freedom; the beams and stanchions or pillars have to be designed with special reference to the stresses, and in the most economical manner, so as to economise material and weight. Thus a steel beam cannot be made deeper or wider to satisfy the appearance than the formula prescribes without adding to the load its own weight, and this is a wasteful mode of using the material. These and other problems will occur to the architect in his designs for new structures which call for a thoughtful investigation.

"PUBLIC BUILDING"—THE STATUTORY DEFINITION.

AMONG the many arguments that may be used to prove the inadequate provisions and defects of the London Building Acts and the need of securing their amendment, the frequent questions that arise as to the meaning intended to be conveyed by certain definitions of the Act are prominent. The terms "party-wall," "party-structure," "topmost story," and others have been often before the Metropolitan magistrates, and our readers may remember decisions which leave much to be desired, both in the magistrate's decision and the framing of the Act itself. Take as an instance the meaning of the expression "public building." Edifices of

this class are sufficiently numerous as to require a rather wide definition, as it must comprehend all buildings constructed or adapted to be used for any public purpose. Every structure that is built for the assembly of people for any purpose, such as a church, chapel, public hall, theatre, ball-room, lecture-room, museum, or library, must come within the term; also any used, or adapted to be used, for any other public purpose, like an hotel, lodging-house, refuge, &c.; but a line must be drawn between such buildings, and those in which persons are received for special purposes. But the term has been extended to include almost any kind of building used as a sort of hospital. The definition runs as follows: "Public building" means a building used or constructed or adapted to be used as a church, chapel, or other place of public worship, or as a school, college, or place of instruction (not being merely a dwelling-house so used), or as a hospital, workhouse, public theatre, public hall, public concert-room, public ballroom, public lecture-room, public library, or public exhibition-room, or as a public place of assembly, or used or constructed to be used for any other public purpose, also a building used or constructed or adapted to be used as an hotel, lodging-house, refuge, or shelter, where such building extends to more than 250,000c.ft., or has sleeping accommodation for more than one hundred persons." This definition is intended to include all kinds of buildings other than dwelling-houses; but in trying to extend its meaning to a variety of structures that are used as houses or hospitals, technical points have naturally been raised by those who desire to evade the regulations. Too much has been attempted in the last amendment of the Act, especially in the addition of the last clause, which includes hotels, lodging-houses, refuges, and shelters exceeding the cubic space mentioned. An interesting appeal case came before Mr. Justice Bruce and Mr. Justice Phillimore a year or two ago. The question arose on a special case stated by a Metropolitan police magistrate to review his ruling on an appeal against the objections of a district surveyor. The Metropolitan Asylums District managers, under a Local Government Board order, have the care of children who, from defect of intellect or physical infirmity, cannot be trained in ordinary schools. The managers purchased dwelling-houses for the purpose of lodging these children. Plans were submitted for alterations to fit the houses for the purpose, and the building had a cubic capacity of 50,000ft. These were submitted first as plans for a public building; but when the requirements of the district surveyor were made, the managers argued that the building was not "public." The magistrate, however, contended that the building was in the hands of the Metropolitan Asylums managers, "used or constructed or adapted to be used for a public purpose," and made the order asked for by the respondent. It was contended for the respondent that the building was *ejusdem generis* with a hospital, and therefore came within the term used, &c., for any other public purpose. For the appellant "Josolyne v. Meeson" was cited. The appeal was allowed. Mr. Justice Bruce said the building in question was not a public building within section 5 (27) of the London Building Act, and he disagreed with the contention that it was a hospital. The building could not be considered as a hospital for the treatment of the sick or infirm. Nor was the building within the section on the ground that it was a building used for "any other public purpose." The substance of the decision cited was that the phrase "public purpose" indicated not a place in which the public had an interest, but one where the could gain admission. Apart from that, building "used for any other public purpose" must be one used for a purpose *ejusdem generis* with those of the enumerated buildings, an

would not include a house used for the purpose described in the case. "The building did not come within the term 'home' because it had not a cubical capacity of 250,000c.ft. or sleeping accommodation for 100 persons." The other judge came to the same opinion—that the building was not a hospital in the modern sense of a place for treating physical ailments. He said: "The Local Government Board and the Metropolitan Asylums Board had anticipated the provision of the Elementary Education (Defective and Epileptic Children) Act, 1899, and had provided houses for the reception of children who were incapable of being associated for the purpose of education with ordinary children, as an adjunct to schools where special arrangements were made for the education of such children. The children placed in these houses were there for the purpose of education, and not for treatment. The houses were, therefore, in no sense hospitals." He was also of opinion that the building "did not come within the words 'buildings used, &c., for any other public purpose.' These were not, perhaps, the best words to have employed; but they were the words which were used in the former Act, and as they had received judicial interpretation in *Josolyne v. Meeson*, they were introduced into the Act under consideration. The words did not include every building used in the public interest, but only buildings used for the purpose which involved the admission of the public—as, for instance, a public lecture-hall, where every member of the public who paid the entrance money was admitted." He was therefore of opinion the building did not come within the term of section, and the magistrate's decision was wrong.

Reading between the lines, we have little doubt the framers of the Act, especially those who revised the definition of the Act of 1894, intended that all such buildings as that erected by the managers under the Local Government Board were to be included within the terms of the section, as the last clause of it we have quoted appears to show; but by adopting the capacity of 250,000 cubic feet, or a sleeping accommodation of 100 persons, they excluded all buildings below these limits, so that such prescription as to size destroyed the general intention of the section to all except those who exceeded it. This decision has at least proved that buildings of the kind noticed cannot come within the term "hospital," which is now used as a place for the treatment of the sick or infirm, and cannot be extended to buildings used for teaching those who are mentally afflicted; nor can the term be applied to every building used in the public interest, but only those which involved the admission of the public.

The distinction is certainly a rather nice one, and we can very well imagine another tribunal reversing the decision if it were possible. As it is, it is a good example of the double meaning that can be attached to the statutory definitions of the Act. The extension of the limits of the term "public building" to include a variety of structures of a semi-public character, such as hospitals, lodging-houses, schools, homes, and refuges has been a source of weakness, and has encouraged building promoters to find excuses for denying the term "public" as applied to certain buildings. The definition would have been more exact if it had stopped at those buildings which are largely used by the public, such as churches, public halls, lecture-halls, and theatres, and had made other provisions not so exacting for the other kinds of buildings named. The idea of those who framed the Act appears to have been to comprise under the term "public building" all other kinds of structure that are not dwelling-houses or domestic buildings. Thus, the expression "domestic building" is defined as including "dwelling-houses and any other building not

being a public building or of the warehouse class." So that if the expression "public building" had defined it as including any other building not being a domestic building or a warehouse, the definition would have been much clearer than it is. By naming a number of buildings for different uses, the definition has been deprived of its real object and exactitude; and the conclusion is that one "used for any other public purpose" must be intended for a purpose *ejusdem generis* with those enumerated. If the words subjoined in parenthesis to school, college, or place of instruction—viz., "not being merely a dwelling-house so used" had been omitted, the decision might have been other than it is. These parenthetical words certainly exclude alterations to a house to fit it for the scheme intended. Many dwelling-houses are converted into lodging-houses, homes, hotels, and schools by removing party-walls and partitions, to which it would be unduly extending the term "public building." The chief concern for such altered structures is the safety of the inmates in case of fire; and this could be insured by enacting that the interior is not to exceed the 250,000c.ft. without the necessity of labelling them "public buildings." The area or cubic capacity of a building has nothing whatever to do with making it public, as the definition appears to imply. Section 79 speaks of the conversion of houses, &c., into public buildings, but does not define the meaning to be attached to the word "public." Of course, the definition we have quoted above is intended; and this comprehends, as we have seen, a number of purposes which can hardly be called public. The section, at any rate, is far from being conclusive. So many domestic buildings are converted, as we have said, into schools, hotels, lodging-houses, and other purposes which can scarcely come under the term. We could refer to other sections of the Act which are equally ambiguous, and are constantly being called into question. These are questions which call for revision at the earliest opportunity. A building phrase or term used in an Act ought to be as correct and exact as we can make it, and avoid all equivocal words and expressions that can be made an excuse for any disagreement. As far as possible, it should not cover too much ground by including other conditions of building, but be made as exclusive as possible. Thus every set of conditions ought to have its own special provisions, rendering it impossible for the cantankerous disputant to attach any other reading to the section. Applying these obvious principles, many of the sections of the Metropolitan Building Act may be found unsatisfactory and often defective.

THE ARCHITECTURAL ASSOCIATION.

THE inaugural meeting of the fifty-seventh session of the Architectural Association was held at the Institute of Architects' rooms, 9, Conduit-street, W., on Friday evening, and attracted a large attendance of members, including Mr. Aston Webb, R.A., P.R.I.B.A., Past President. The chair was occupied by Mr. Henry T. Hare, the President, who received a cordial greeting on taking his seat. Fifty-four nominations to membership were read, and Mr. Arthur Keen was elected as a member by acclamation, and Messrs. L. Sage, C. Granville Baker, and W. J. Waghorne were reinstated in membership. The President proposed the election as an honorary member of Mr. T. Sudsuki, mentioning that this gentleman had been sent by the Japanese Government to study the educational methods of architectural bodies in England. At a later period Mr. Sudsuki was also commissioned to visit various Continental countries for similar investigations, his entire tour being intended to extend over four years. The motion was carried by acclamation, and Mr. Sudsuki suitably acknowledged the compliment in idiomatic English, expressed with some deliberation. The President announced that, in consequence of the appointment of Mr.

H. P. G. Maule as master of the A.A. day school, a vacancy had arisen in the honorary secretaryship. To fill this Mr. Louis Ambler would be proposed by the committee at the next meeting, and in Mr. Ambler's stead on the committee Mr. G. B. Carvill would be nominated. A vote of thanks was accorded to the Bath Stone Firms for arranging a visit to the quarries and for entertaining the members last week; a similar vote was accorded to Mr. Mowbray A. Green for organising and conducting a series of visits on that occasion to buildings of interest in the city of Bath.

The studentships and prizes gained during the last session by members of the day school and evening classes were then distributed by the President. The prize designs were reviewed, and the list of awards published in our issue of June 26 last, p. 883 last volume.

The President then delivered the following

OPENING ADDRESS.

When we met together in this room a year ago you may remember, Mr. Hare remarked, that I expressed the hope that I should shortly be in a position to make an announcement that the pressing question of our new premises has at last reached a solution, after having constantly occupied the attention of your committee for many years. Session after session allusion has been made to the subject in the Presidential Address, and it may well be that your patience and hope have become well-nigh exhausted. The anticipation is, however, now happily fulfilled, and after long negotiations we have been able to take possession of the Royal Architectural Museum, for so many years located in Tufton-street, Westminster, and formerly housed at the then Brompton Museum. This fortuitous consummation being reached, your committee forthwith proceeded to the consideration of many proposals for the adaptation of the premises to our needs: were able to instruct their architect, Mr. Leonard Stokes, one of our past-presidents, to proceed without delay with the work; and to accept the estimate of Messrs. Holloway Brothers. To-day substantial progress has been made, and there is no doubt we shall be able to move into our new home at the end of March next. I have no intention of wearying your patience with the long and deeply-interesting history of the

ROYAL ARCHITECTURAL MUSEUM,

that has already been written in part; and now, no doubt, the time is at hand when an authentic and detailed account of its origin and progress will become an obligation posterity may demand. It will be enough to say that it has had a long and brilliant past, and that it is a tangible evidence of the potency of the Gothic Revival. Some may here be led to remark that that cult had become effete; that the institution had fallen upon evil days and was passing away in senile decay. If such were the case, it is but a surface truth, which accomplished events have abundantly disproved. True! the museum had become out of sympathy with its environment through the trend and evolution of architectural progress, in which it had held such a pre-eminent position, and exerted such a widespread influence. It is the fashion, in looking back on the Gothic Revival, to speak slightly of the enthusiasm which possessed its leaders, or to regard that enthusiasm as worthy of a better object. The direct effect, however, is with us to-day in our emancipation from the artistic paralysis of the first half of the last century. The leaven is still working, with full and perhaps increasing potency, and the wonderful Renaissance is yet only emerging from its shell, and there is promise of such glorious developments as may perhaps eclipse the greatest triumphs of the past. Beneath the apparent desolation of the museum was a latent vigour, based upon our indigenous architectural traditions destined to successfully receive the graftings of such a vigorous constitution as that of the Architectural Association, whereby to renew its strength, and with regenerated powers to influence for lasting good our noble profession. This sketch is not overdrawn, and while we are accepting new responsibilities, we are also investing ourselves with a heritage in delightful associations and replete with potent possibilities. The interests centred at Tufton-street are one thing; the collections are another, and without going further into that it may be said that the study and contemplation of the contents of the museum and of the cognate studies there represented have had no small part in the great Renaissance to which I have just referred. It will be

impossible to adequately refer to the long roll of honourable names linked with the history of the museum, but I cannot refrain from reminding you that among those in the past have been H.R.H. the late Prince Consort, Earl de Grey, Ruskin, Donaldson, Sir Charles Barry, Beresford Hope, Scott, Cockerell, Penrose, Pearson, Brandon, and a host of others; while in the living present we have Mr. John P. Seddon, Mr. Aston Webb, Sir William Emerson, and Mr. Maurice B. Adams, who for so many years has acted as honorary secretary, and through whose enthusiastic interest the idea of fusion has been translated into a reality. These are names which will be for ever connected with the Royal Architectural Museum. We see to-day noble blocks of Government buildings rising in Whitehall, which strangely seem to recall to memory the hot controversies and battle cries of the styles which raged when the Foreign Office designs were prepared by Sir Gilbert Scott in a manner alien to his sympathies. In all of this, no doubt, Tufton-street exercised a not unimportant influence. Scott is generally supposed to have vindicated in St. Pancras Station what he would have done in Whitehall had he been so permitted by the powers that then were. In those days the Museum was a centre of light and leading, and I trust that it may still be in a more extended way a factor to be reckoned with in the architectural movements and interests of the day.

THE DAY SCHOOL.

The past year has not only been significant and epoch-making by what may be designated as the great departure, but it has been rendered notable by the successful completion of the first year's working of the day school. This is a matter for sincere congratulation, and this fact is important enough in itself to have taken precedence of everything else. However, these two events have come together side by side: the school demonstrating beyond all dispute the inadequacy of our present premises. This climax may well encourage us in the highest anticipations for the future progress of our society under the more favourable conditions which we shall enjoy in our new home. After two years of ungrudging labour Mr. Arthur T. Bolton has, greatly to everyone's regret, relinquished the post of head master of the day school, which he has filled with unqualified distinction, and the success which has attended the school is doubtless due in a very large measure to his devotion. To undertake a mastership is one thing, to organise and originate is another. Mr. Bolton has done both. Our ideal has been to give definite and systematic instruction by a one year's course of training preliminary to office work, and, when desired, to supplement this by a second year's course of more advanced study. This instruction is partly intended to enable the student to gauge in a measure before life is too far advanced his capacity, and to test practically his inclination for entering the profession. The latter consideration need not be present, but had it been possible for many now alas! in practice, perhaps some careers would have been happier and architectural reputes more unsullied. The instruction which our day students receive at the hands of the master and his assistants is based on principles which are intended to enable an intelligent interest to be taken in what they will see going on around them when they enter an office, and to assist them to assimilate the knowledge which will be at their disposal if they can but seize their opportunities. Some of us can recall happy days of long ago, when enthusiasm was high, and zeal, often misdirected, outran knowledge. This spirit Mr. Bolton has been able to foster, and to direct to sources of wise inspiration. I cannot do better than invite you to inspect the results evidenced by their work, and to come and see the schools in operation for yourselves. The progress so far has been most gratifying, and we shall watch with signal interest the subsequent careers of those students who have had the good fortune to pass through the school. This success is all the more remarkable as having been attained under the very difficult restrictions which the present premises imposed upon us. When we enter upon our new home next year, we shall confidently expect to see corresponding developments. To fill the vacant mastership has been a difficult and anxious duty. I am certain that the selection of Mr. Maule has the full approval of the Association. The responsibilities of the post are by no means light, and whatever the new master's opinion of his own fitness may be, all will agree that no better choice could have been made. In connection

with these two topics, before leaving them I have two appeals to make.

PUPILS WANTED FOR THE DAY SCHOOL.

First in regard to the day school, I take this public opportunity of commending it to the consideration of parents, guardians, and heads of public schools, as affording an excellent means of testing the aptitude of the coming man for his future profession. Should experience show within twelve months that he is unsuited for the calling of an architect, he will have been no loser thereby, but will have gained much information useful in other walks of life, and will have been spared the drudgery of an uncongenial occupation. The other appeal I have to make is to a wider audience than that represented within this room. I refer to

THE BUILDING FUND.

which still requires to be largely augmented before we can hope to be free from debt. The work on which we are embarked at Tufton-street is one which is in the interests of every member of our profession; indeed, I do not think I am guilty of exaggeration if I say that it is of national importance. In every other great country it would be undertaken or heavily subsidised by the responsible government; here, however, it is left to private effort, and the greater need there is therefore for every member of the Association and the profession at large to afford the utmost support which their means will allow. The Association numbers nearly fifteen hundred members, and one might reasonably expect that each one of these would contribute to an object which is so much in their interest. Up to the present time, however (although we have to thank many generous donors), less than one quarter of our members have responded to the appeal. I feel that some great effort should be made to bring the general body into line, and I here invite every member to follow the example already set by your committee, by doubling the amount of his yearly subscription for this session only. This should be within the means of all, and produce a community of interest, which would be for the good of all. The provincial societies have also an interest in this matter, and very welcome have been the contributions sent by some. I commend the good work heartily to the others, and indeed to all persons interested in the progress and advancement of architecture (and who should not be?) as a national British art, and ask them to show their practical sympathy by coming forward to assist us to complete the provision of the large sum necessary for the adaptation and enlargement of the Royal Architectural Museum to the purposes of the Association. We have had to undertake certain financial responsibilities relative to and contingent on the acquisition of the property and its extension, while in addition to this there will be considerable outlay in the rearrangement and exhibition of the valuable collection of casts, which will be open free to the public as heretofore. In regard to the latter we hope to make the collection as far as possible representative, chronological, and useful in every way to students at large. Many have laboured for the Association in the past and given ungrudgingly of their time and means. We to-day may enter into their labours and continue them. I feel sure I shall not appeal in vain, and that the provision of these highest and indispensable facilities will not be left to become a burden to the Association, and a drag upon its work and progress.

TWO GREAT LOSSES BY DEATH.

Death is ever too busy about us, and to-day we have to lament the loss of some valued colleagues whose sympathy and counsel have helped us in the past. The late Mr. F. C. Penrose was associated with the early days of the excursion under Edmund Sharpe. We also deplore the loss of Professor Roger Smith, twice President of this Association, ever its kind adviser, and the friend and learned instructor of all young men brought under his helpful influence.

A WORD TO STUDENTS.

In drawing to a conclusion, I have a few reflections which I wish to offer to our student members. I might again advise the enthusiastic pursuit of the study and delineation of ancient buildings, or the fruitful results that await the diligent student of architectural literature, without enlarging on either, which I have done before. I would again heartily commend both to you. What I want to do is to venture to suggest the deliberate consideration of such studies as are

the outcome of demonstration and experience, observation and research, rather than the perusal of books and the abstract theories of mankind. Sir Norman Lockyer, in his illuminating address before the British Association, made this pregnant statement: "From neglect of research comes imperfect education, and a small output of new applications and new knowledge to reinvigorate our industries." It seems to me that much of the deplorable wickedness which we unfortunately see abounding in the thoroughfares of our cities and towns is the result of (to put it in better words than mine), "old rule of thumb processes, which are preferred to new developments"—a conservatism too often resulting from the master's own lack of knowledge. This may seem a hard saying, but it should be our object, as much as lies within our circumscribed and limited powers, to develop and foster the abilities with which we are all more or less endowed. It is no crime to be young, and all possibilities lie with youth, so that in a way it may be said that to be young is to be successful. To secure our well-being as a profession it is highly important to see to our organisation and equipment, the consideration of which is to us personally as important as the provision of "battleships and big battalions." It is brain, therefore, that we want, fortified by the experience and research of others, and it is the practical personal study of the design and execution of modern work by modern masters, reinforced by the rich heritage of art which has come down to us. It has been recently said, "It is a great thing to learn to use other people's experience, and to get it first hand, not trusting entirely to books. Knowledge obtained from men is the most mentally nourishing and the most easily assimilated." What I would leave with you is the picture sketched by Robert Browning:—

Here work enough to watch
The master's work, and catch
Hints of the proper craft, tricks of the tool's true play.

Mr. G. H. FELLOWES PRYNNE, Past President, in proposing a vote of thanks to the President, expressed his great regret that Mr. W. H. Seth-Smith, who had taken so keen an interest in architectural education, was prevented by ill-health, partly due to overwork, to be present. The President had established two records that evening. The first was to make the welcome and long-deferred statement as to the new premises, a phantom that had eluded every previous occupant of that chair. The second was to have read the briefest address yet given, and yet one which was as full of suggestion as it was concise. The work to which the Association had set its hand was progressing with great energy, and the zeal and application of Mr. W. B. G. Lewis, and the staff of lecturers, at 56, Great Marlborough-street, had inspired the students to go forward. The day classes had been largely originated by Mr. Seth-Smith; but the contemplated removal to Tufton-street was in great part due to the present President.

Mr. J. SIVENRIGHT GIBSON, in a speech marked by dry humour, seconded the motion, observing that it was wonderful to outsiders that presidents of architectural bodies should find something fresh to say in each annual address, and still more wonderful that they should always find full audiences to listen to their advice and suggestions. Unfortunately, the general public did not now take the keen interest in architectural questions that they did when the "battle of the styles" was being fought with such vigour, and when A. W. Pugin was publishing his "Contrasts," so full of fun and strength.

Viscount HAYASHI, the Japanese Minister, who was cordially received, in supporting the motion, observed that Japanese architects had beside the ordinary problems of architectural work a great difficulty to encounter in the form of making provision for the stability of buildings which were subjected to frequent shocks of earthquake—a difficulty which did not need to be taken into consideration by most of their confrères in other lands. Many tourists to Japan had, however, formed an erroneous impression regarding Japanese buildings. They had written and spoken of the houses as tent-like structures, supported with posts pasted over with paper to serve as walls, which might lead to the inference that it only required a shower of rain in summer or a snowstorm in winter to reduce such flimsy structures to total wrecks. That such statements were not exactly true was proved by the fact that most of the houses were old buildings of substantial character, being as much as four stories high.

Some of the pagodas rose to a height of from 150 to 200ft., and there were pagodas in Tokio 650 and even 1,200 years old.

Mr. ARNOLD MITCHELL remarked that Mr. Hare's position in that chair and in his profession was a fresh proof that the only road to success was sheer downright hard work, and the inception of the new premises was largely due to his energy. The value of the Association schools and classes would, he believed, be evident in the work of the architects of the future.

Mr. HENRY LOVEGROVE and Professor BERESFORD PIERCE also supported the vote of thanks. The latter remarked that these annual addresses served a useful purpose if they induced architects to look before and beyond, and to take stock of their personal standing. Ordinary papers dealt with a variety of specialised subjects which had to be mastered by the architect. The Association was a body of students with absolute liberty to think for themselves, and so to preserve the sturdy independence of art. What in the absence of enthusiasm was there to inspire the student to do things worth remembering? Upon the powers of the designing members of that Association depended the future of architecture in England. There would be reflected in their work not the Association's stamp, not their education, not their training, but what the young men of the present day were in themselves. The art of architecture was as truly an expression of human thought as was music or poetry. Architecture inspired, excited, incited, enthused the mind of the student in a way which no other form of work could emulate, and until the student felt this he was not worthy to call himself an architect.

The vote of thanks having been carried by acclamation, the President briefly responded, remarking that Mr. Arnold Mitchell gave him far more credit for the scheme of removal to the Architectural Museum premises than was his due. The whole of the credit of the original idea belonged to Mr. Maurice B. Adams, who was the first to propose it and make the offer, and it was entirely owing to Mr. Adams's enthusiasm that the committee of the Association were able to avail themselves of such an advantageous offer.

ARCHITECTURAL EVOLUTION.*

BEFORE commencing my paper may I be allowed to say a few words about the work of the Chair to which I have recently had the honour to be appointed? The Chair was founded in 1840, and is therefore the oldest Chair of Architecture in England. T. L. Donaldson was the first Professor, and his memory is kept green in the college by the silver medals presented annually which bear his name; Hayter Lewis was the second, and the third was Roger Smith. Those who knew Professor Roger Smith will bear me out when I say that his kind heart and lovable disposition made him many friends. He was ever willing to give his time to younger men who came to him for advice, and his ripe experience was always at their service. My acquaintance with him, although slight, commenced many years ago, shortly after he was appointed to this chair. Recently I had occasion to see him two or three times on a certain matter, and nothing could exceed his courtesy and kindness. His death will, I feel certain, be keenly felt by the many who during his long tenure of the Chair had the good fortune to be his students. Professor Roger Smith, like his predecessor, confined himself chiefly to lectures arranged for students whose work in the daytime in offices left them only a few spare hours for outside study. No other course, doubtless, was possible in the days when the pupilage system was the only method by which men could study to be architects. But architectural education, like education in other subjects, is undergoing a change. The pupilage system will continue, but it seems probable that it will continue in a modified form. It will continue, because only in an office can men get thoroughly in touch with actual practical problems and learn the inner mysteries of their profession: it will probably be modified because the feeling is growing that to enable a student to reap the full benefit from the work placed before him in an office a preliminary training is necessary. Lectures after office hours are unsatisfactory for many reasons. Moreover, in any systematic course of study for our profession, and I think I may say

for any other also, interest centres not in the lecture-room, but in the studio, laboratory, or classroom as the case may be. Lectures in any course of study of a practical character are but interludes; they have their value, but they require supplementing so much that to make any course of real value a student's whole time has to be devoted to it. The council and faculties of this college have realised the necessity for a more systematic course of training for architectural students than has been regarded as possible in the past. I believe with them that the time is ripe for a departure from former methods, and I also believe that before many years have run, university courses in architecture will be as general in England as they are now in America, and in some of our colonies. Architectural evolution is not merely a matter of academic interest. It has its practical side, which is of value to all architects. To trace the workings of a man's mind in his work; to see how, ever observing the requirements of his time and adapting himself to his materials, he took an idea from here and an inspiration from there, and so treated them as to give them new expression, is in itself excellent practice for all who are called upon to design. As an historical study it is the most fascinating of any. That all styles, from the earliest days of Egypt to the time of the great Renaissance of the 15th century, form an unbroken sequence, few will deny. A few links here and there may be missing in the chain, especially in the earlier work, owing to the lapse of years, but these are becoming fewer and fewer daily. In a short paper like this it is impossible to mention every instance or to trace every step. All that can be done is to illustrate the truth of the contention by reference now to an individual building, now to a group of buildings, and now to some constructive point which had considerable bearing on the development of a style. Other instances, doubtless, will occur to many of you of like importance which might with equal fitness have been given.

Of the many factors which determined architectural development in different countries and at different periods, climate, religion, the nature of buildings, the materials available, and the state of the labour market may be regarded as the most important. All these exercised their influence in turn. Rome, with its teeming population inclosed within its walls, a population which demanded not only houses to live in, but also vast public palaces for their recreation and amusement, required buildings very different from those of simpler Athens. To have built these, many stories in height as most of them were, with the lintel of the Greek, would have been an extremely difficult, if not an impossible, task. The Romans, therefore, would have been forced into using the arch, even if they had not early acquired a taste for it from the work of their neighbours the Etruscans. But the arch by itself would not have been sufficient to overcome all the difficulties they had to contend with in the erection of a huge building such as the Colosseum, if it had not been that, in the neighbourhood of the city, there existed ingredients which formed a remarkably strong cement. This enabled them to use concrete to a far greater extent than had been done before, or has been possible since. For the mixing of the concrete and its employment for walls and vaults unskilled labour was all that was required.

The Greek temple, with its small naos and external peristyle, was eminently appropriate in a country where the people lived much out of doors, and where the public worship was performed outside and not inside the building; but when Christianity became general, the services demanded a different type of building even in countries where the climatic conditions were much the same as those of Greece. The changes which were made are well illustrated in the present Cathedral of Syracuse, which is one instance out of many of the conversion of a temple into a church. A wall was built between the columns of the external peristyle, so that the ambulatory became the aisles. Openings were pierced in the naos wall to connect the aisles with the nave, and a chancel was built out at the east end. The entrance was reversed, and the posticum of the temple became the porch of the church. When new churches were built, the idea for these was taken from the colonnaded timber-roofed basilicas of ancient Rome. In the early days of Christianity money was scarce and workmen as a rule unskilled, and the basilican plan and methods of construction provided the largest possible floor-

space for the congregation at the lowest possible cost. Moreover, after the time of Constantine, old marble columns to divide the nave from the aisles were to be had almost for the asking from the ruins of the secular buildings of the great city, and by their aid a decorative effect could be obtained without much expense. In claiming that all architecture is evolved from previous efforts, one is merely reiterating the old truism that nothing comes out of nothing. The contention does not rob an artist of his claim to originality. It merely emphasises the fact that true originality—the originality that produces lasting good, and is not merely a passing fashion—is the outcome of knowledge. This knowledge may be either traditional, as in the days when the secrets of a man's craft were handed down from father to son for generations, or it may be acquired by study, as was the case with Brunelleschi, Bramante, and other great early masters of the Renaissance. An architect of the present day has to conform to much the same requirements and to work with much the same materials as the myriads of his predecessors. All that he can do is to try and advance one step further than they have. Behind him is a vast store of accumulated treasure, and if he can extract from it a few grains, and infuse into them his own spirit, his own individuality, he has done as much as anybody can expect to do. What is *art nouveau* is seldom true art, and what is true art is never entirely new. To say that Anthemius of Tralles learnt much from his Greek and Roman predecessors is not to detract one iota from his reputation. To hint the opposite is only to suggest a doubt as to his sanity. In his beautiful detail the inspiration drawn from ancient Greek mouldings and carvings is so undoubted that even if the connecting links were lost—which is far from being the case, as the work in Syria of the 4th and 5th centuries shows—the similarity between the two is proof enough. Not quite so apparent at first, but really quite as great is the connection between the plan and construction of his great church, St. Sophia, Constantinople, and such a Roman building as the Basilica of Constantine. In both buildings the supports are few, and consist of two great piers on each side, which separate the nave from the aisles, and mark the three compartments of the central area. The side buttressing to resist the thrusts is similar in both and each building, has or had a screen of columns between the great piers, which served to support the galleries, and at the same time to give scale to the building. The screens in the church still remain, and form one of its most beautiful features: those of the Basilica have long since disappeared. Where the church differs principally from the Basilica is in the plan of the ends of the central area, and in the substitution of the dome for the intersecting vault. Each bay of the basilica is square, and all three are equal. In the church the central bay alone is square, the ends are semi-circular, and opening out of each big semicircle are colonnaded niches. The double apse arrangement is a Roman device. One of the large halls in the Baths of Diocletian, Rome, has an apse at each end, and full width of the hall, and a similar plan was also followed in many of the entrance vestibules to buildings such as the baptistery of Constantine and the tomb of Constantia. The idea of the colonnaded niches is also Roman, if the restoration of the Baths of Gallienus, of the 3rd century, are correct. Even if they are not, St. Sophia is not the earliest Byzantine building in which they occur. They form the most characteristic feature of the interior of some of the circular and multangular churches of the period; of these, St. Sergius, Constantinople, San Lorenzo, Milan, and St. Vitale, Ravenna, were commenced before the old church of St. Sophia was burnt, and consequently before the design for the new one was made. But although the idea was old, the application of it was new. The plan of the central nave of St. Sophia is as though one of these circular buildings had been cut in half, and one half tacked on to each end of a central square. The result is a noble hall, which for about 220ft. has an average width of over 100ft. No other building of architectural pretensions in the world, not even St. Peter's, Rome, has an unencumbered floor space so wide for such a length. Anthemius showed his genius to a still greater extent in his treatment of the ceiling. He took the circular dome of the East, which from the early days of Assyrian art, many years before Christ, had ever been a feature there, and by the aid of pendentives placed it over the great central

* Inaugural Address read at the opening of the London School of Architecture, University College, London, on Wednesday, Oct. 7, 1903, by Professor F. M. SIMPSON, R.I.B.A.

square, high above the transverse and longitudinal arches. This was a wonderful achievement, not because of the mere span of the dome (that of the Pantheon is nearly half as wide again), not because a circular dome had never before been placed over a square by the aid of pendentives (examples exist in the East as early as the 2nd or 3rd century) but because no dome approaching in size that of St. Sophia had ever before been raised in that manner. The nearest approach to it is the 80ft. dome which covered San Lorenzo, Milan; but in this example it is doubtful if the space below was ever other than octagon. I have dwelt at some length on St. Sophia because it is not only a standing example, and a great one, of the truth of evolution in design; but it is also the most truly original, and at the same time, in my opinion, so far as the interior certainly is concerned, the most beautiful architectural creation in the world. It is a proof of the extent of Anthemius's originality, that he could combine eastern and western traditions, and yet produce so great a masterpiece. One of the most interesting chapters on architectural evolution is that which deals with the development of groining and the substitution of the clustered pier for the cylindrical column. The two must be considered together: they are inseparable. In the basilican churches, the intersecting vault which played so important a part in the large buildings of Imperial Rome finds no place. It occurs occasionally in early work in a few small churches in some parts of Italy; but it was not until the 11th century was well advanced that it became general in large ones. Basilican churches have timber roofs, which, as a rule, are ceiled on the under-side; the 15th and 16th century flat coffered ceilings at present in many of these churches probably took the place of earlier ones of similar design. These ceilings are continued without a break from east to west. In the Church of St. Miniato, Florence, however, built at the commencement of the 11th century, the timber roof over the nave is broken in its length into bays by means of transverse arches thrown across from pier to pier, with corresponding arches across the aisles. Whether these arches were introduced in the first instance because it was found by experience that the lofty and not over thick nave walls required lateral abutment, or because the builders had come to regard an unbroken ceiling as monotonous and unsatisfactory in appearance, is uncertain. The fact remains that about the time mentioned they began to be used, and consequently St. Miniato and one or two other churches of the same period may be regarded as the connecting links between the earlier church with its unbroken timber roof and the later church, which was divided into bays, each bay being vaulted. The vaults themselves were at first constructed much in the same way as the Roman vaults, without transverse arches, except that they were not so massive and heavy. The first alteration was that transverse arches were added, and the vaulting formed into bays. This innovation, slight though it appears at first, led to important changes. Diagonal ribs were next introduced under the groins—or points of intersection of the vault—and these, together with the transverse arches, formed a skeleton on which rested the severals or compartments of the vault. The vault now became a groined and ribbed vault which required specially-designed piers to support its different parts. The cylindrical column was ill-adapted for the purpose, although it is true that in some of the finest of the Medieval churches in France it continued to be used a century after the principle of vault supports had been perfected. The clustered pier, therefore, took its place. Piers, oblong and square in plan, had, it is true, been used occasionally in certain places in some basilican churches before this; but for the development of the complicated clustered plan from these more simple forms vaulting is entirely responsible. The change commenced with the introduction of transverse arches. In the small church of St. Zetache, Milan, of the 9th or 10th century, in which arches span the aisles but not the nave, the piers are not oblong but T-shaped, and the arches rest on the ribs at the back of the piers, and on corresponding pilasters on the aisle walls. When arches spanned the nave as well as the aisles the piers became cruciform. In St. Miniato, Florence, those that support the transverse arches are quatrefoil in section. This form, or the cruciform, was satisfactory so long as only transverse and longitudinal arches were employed, but as soon as diagonal ribs were introduced it became

insufficient, and shafts had to be inserted in the four internal angles of the cross to support them. In the nave of St. Ambrogio, Milan, built in the second half of the 11th century, the system is complete, and every rib and arch has its corresponding member in the pier. The buildings of the 11th and 12th centuries throughout Europe are heavy in appearance and massive in all their parts, but as the workmen grew more skilled, the work became much lighter. Nowhere is the change so conspicuous as in the vaulting and in the size and form of the piers. It was soon discovered that there was no necessity to carry the groining shafts down to the floor, and that they were better corbelled out from the wall, as then they offered more resistance to the thrust of the vault. Sometimes the corbelling is just above the piers, as in Exeter and Lincoln Cathedrals, sometimes it is at the level of the stringcourse above the arches of the arcade, as at Carlisle, and sometimes higher up still, above the triforium, as at Salisbury and Wells. In consequence of this change the piers could be made more slender, and beautiful forms such as are to be seen in Exeter Cathedral and in other churches of the 14th century were the result. Other modifications all tended in the direction of lightness. As the number of ribs of the vault increased, instead of attempting to provide a separate skewback and separate support for each—which in England would have been impossible in late work owing to their number—the builders brought them together to a common springing and the tas-de-charge, with its many advantages, was produced. In France the architects, as a rule, even as late as the end of the 15th century, clung to the simple and dignified quadripartite vault, in which only transverse arches and diagonal ribs are employed. In England, however, they departed from it, and multiplied the ribs to such an extent that the vault became a network of ribs so close together that little room was left for any filling in. As soon as this point was reached, the reason for the construction followed, for solong, disappeared, and the workmen said to one another, "Why form a skeleton and fill in afterwards? Why not build both rib and filling in together?" Thus was born the fan-vault—an English design pure and simple, and a logical outcome of the multiplication of ribs—in which both moulded rib and panel are worked on the same stone. I have taken groining as an illustration because it is the most characteristic feature of Medieval Architecture; but a similar sequence of development is just as noticeable in other parts of a building. I might have shown, for instance, how the design for the blind arcading on walls changed its character until the large windows of the 14th century left little wall space on which arcading could be placed, and how, as the windows became more and more like panels pierced for light, what wall space remained was covered with sunk panelling, to such an extent that in some churches, especially in those which retained their old stained glass, it is often somewhat difficult to tell at a glance which is wall and which is window.

The shock of the Renaissance first felt in Italy at the commencement of the 15th century was a shock which the builders there richly deserved. In England it came 100 years later, partly because the traditions of Medieval art were far stronger here than in Italy, and partly because the revival of letters had not yet taken a strong hold in this country. The great men of the Italian Renaissance, in seeking for inspiration from the ruins of ancient Rome, did a grand thing for architecture. They felt that the old art was moribund, and needed strong measures to bring it back to life. They had no qualms about taking hints from their predecessors of centuries before—from the men who built so sturdily, if somewhat roughly, and on so noble a scale. They felt that in the old buildings there was a virility that was deathless. The more they studied them, the more they became imbued with their spirit. And in this absorbing process they lost none of their own individuality. They sacrificed nothing to archaeological correctness. They never allowed tradition to interfere with utility. They abandoned none of their building science—science which had been accumulating for centuries; in fact, they added to their store. No one can say that Brunelleschi's dome in Florence is a copy of anything which had gone before. Its construction is different, its form different, and its detail. Sansovino's library in Venice, although reminiscent of the Colosseum, only shows what can be done by a man with fine ideas and rich imagination,

who is also a student of architecture. Peruzzi's charming Palazzo Massimi in Rome—a gem which stands alone amongst the colour-washed palaces of the city—has a refinement which no ancient Roman building possesses, and shows that the Greeks had not taught in vain the value of simplicity, and the full beauty of the lintel. These men picked up anew the thread of Classic traditions, which, although entangled for centuries with other threads, had never been entirely lost in Italy. Their work, although not coming in natural sequence like the Byzantine, Romanesque, and Gothic, has still a place in the history of architectural evolution. It was not so much a Renaissance as a recovery. What chance have we to-day of a similar recovery in England? The conditions which exist here now are not so far different from those which prevailed in Italy in the 15th century. It is true that the fine traditions, started by Inigo Jones and continued by Wren and his followers, were all destroyed by the two revivals of the last century; but we still have their buildings almost as fresh as ever. The lapse of years since they were built is trifling, compared with that which separates the early days of the Italian Renaissance from the time of the Roman Emperors. The threads ought not to be so difficult to pick up. In fact, one may fairly say, when one considers much of the work of the last ten or fifteen years, that this has already been accomplished. How long, however, shall we continue to hold them? When one remembers the see-saw of the last half of the century just passed, he would be a bold man indeed who would venture to prophesy. And yet agreement amongst architects is absolutely essential if our art is to progress as it should progress. No art can advance satisfactorily when its exponents are pulling in different directions. Such a state of things is bad for architects, and worse still for workmen, as they are called upon to work in one manner one day, and in another the next. Is it to be wondered at that, under the circumstances, they so often fail to take an interest in what they do? It is unsatisfactory also for the general public who, seeing no standard, are apt to believe that there is no art.

For a real advance, harmony between architect, builder, and client is essential. It existed in the 18th century in England; it existed in the 15th century in Italy; it is the secret of the stride made by architecture in the Middle Ages. It is true that in one sense the old war of the styles is now over. It is true that men are no longer eager to cut one another's throats over the merits of two phases of architecture, or to dispute with each other regarding the correctness of the curve of a moulding. But is it peace? There are still two camps. There are still Classicists although they are no longer pedants, and there are still Romanticists, although they have ceased to be mock-Medieval. A fusion between the two, if it be possible, although it would take time would be worth some waiting for. Some years must elapse before one can be expected to lay down with the other. But as the Classicist gets a little more playful, and the Romanticist a little more formal, the two may meet. After all, the principles underlying good work are much the same in whatever language they are expressed, and the differences perhaps are not so great as appears on the surface. In the last century men fell into the evil of a too literal rendering of old work; but that is no reason for going to the other extreme and ignoring it altogether. It seems to me that the folly is quite as great to refuse profit by the successes and failures of the past as it is to remain indifferent to and ignore new developments in building science. The masters of the Renaissance succeeded because although they studied old work they did not copy it. They blended its essence with the requirements of the time, and so produced new art. As they worked so might we. What is wanted is a basis from which to start—something that the weaker can fall back upon, and the stronger advance from. And if there can only be agreement as to what that basis should be, there is every chance that the end of the century will see a traditional vernacular style once more flourishing in England, and that another chapter will be added to the history of architectural evolution.

New Board schools, which have been erected at Canterbury at a cost of about £20,000, including site, to accommodate 1,020 children, were formally opened by Dean Wace last week.

CHARTERED SURVEYORS.

THE Council of the Surveyors' Institution have just issued to the members copies of the by-laws of the Institution, as amended by general meetings of members, in accordance with the provision of the Royal Charter, and sanctioned by His Majesty's Privy Council.

Among the important amendments now introduced is the permission to Fellows to use the title "Chartered Surveyor" alternatively to the designatory letters "F.S.I.," and a similar option to professional associates to use the like "Professional Associate Chartered Surveyor" in lieu of "P.A.S.I." The change has been long in contemplation, but any alteration of the by-laws of and institution incorporated by Royal Charter involves numerous formalities, and the Lords of the Privy Council are not moved to sanction any innovations until they are fully convinced that their effect will be to more completely carry out the objects for which the Charter was granted.

Among the reasons for this new step are, we understand, a recognition of the necessity to prevent, in the public interest, as well as in the interest of the profession, any misleading use of the designatory letters. It has been found difficult, if not impossible, to deter unprincipled persons from using any particular alphabetical combination unless a fraudulent intent could be clearly shown, and, again, it has been felt that, to the ordinary client desiring to engage the services of an expert, the letters F.S.I. do not convey any guarantee that the user of them is a member of a society authorised to test and certify his professional capability. These two points would be amply met were the designation "Chartered Surveyor" to be widely adopted by Fellows of the Institution, as we have no doubt will be the case.

Among other changes effected by the revision of the by-laws is the adoption of certain rules which shall be deemed fundamental rules of the institution, and the breach of which shall subject a member to suspension or expulsion. A member is forbidden by these rules to engage in or be connected with any trade or occupation inconsistent with his profession, to allow or to agree to any participation by a solicitor, accountant, or liquidator, in his fees, or to accept illicit or secret trade or other discounts, commissions, or allowance in connection with his professional business.

A new by-law provides for the suspension or exclusion of members guilty of infringing the said fundamental rules or of felony or fraud, or who have been adjudged bankrupt or have made an arrangement with creditors. It also forbids the improper use of any professional designation, description, or initials, and the use by a firm of designatory letters or descriptions where some member or members of the firm are not members of the Institution.

WATER SUPPLY.*

ALTHOUGH there are many treatises and papers on this branch of engineering, the volume recently published by Charles Griffin and Co., Ltd., written by Mr. Reginald E. Middleton, M.Inst.C.E., &c., will be welcomed by students and practical engineers. The author sets forth in a concise manner the scientific principles of the subject, and the work will serve as a good introduction to the larger treatises that have been published. The author devotes special attention to such questions as the quality of water, interpretation of analyses, stability of masonry dams, flow of water through pipes, and other elementary matters. Thus in Chapter I. he found under various heads such questions discussed as "selection of source," investigation of head, engines and pumps, impounding reservoirs, compensation water, mode of purification, filter beds, several reservoirs, distribution, &c. To assist the mind of the student a diagrammatic table or summary is given of the main points advocated. In respect rainfall there are three kinds: rain falling on paved surfaces, rain percolating underground, rain falling on roofs not collected. Requirements as to quality of water are next enumerated. The author shows that no water is chemically pure; mineral purities of various kinds are mentioned, gaseous, gettable, and animal impurities. Under the heading of "Bacteria" and "Non-pathogenic

Germs," the importance of this branch of inquiry is pointed out. Of the latter the larger number of micro-organisms are shown not only to be non-injurious, but indispensable to healthy existence. Tests for hardness and various chemical properties are mentioned which are necessary to be known before the requirement of quality is met. The engineer must know the history of the water supply and its exact composition before making any decision. Requirements as to quantity are equally important, and have to be next considered. As to rate per head for domestic purposes the unrestricted consumption seldom exceeds 17 gallons per head per diem in towns, and 12 gallons in rural districts, and a provision of 20 gallons in urban and 15 gallons per head in rural districts is ample. The variations in demand and monthly variations are stated. For a single day the demand may exceed the average by 40 per cent. The causes of waste are pointed out, much of which is preventable, due to leakage in pipes and defective cisterns. There are few places, the author says, in which the amount of waste is less than 10 per cent. The average rate of increase can be determined graphically, and this is shown by a diagram. How to determine the catchment area is shown, and the manner of estimating the quantity. The rule is thus stated: "To obtain the quantity, multiply the catchment area or area of gathering ground in acres by the available rainfall in inches, and if the quantity is wanted in cubic feet, multiply the result by 3630; but if required in gallons multiply instead by 22,650." It is useful to remember that lin. of rain per annum represents a flow of 40,000 gallons a day from each square mile of catchment area. The deductions from rainfall, evaporation, and flood are pointed out. The directions given by the late Mr. J. G. Symons for securing uniformity of practice among rainfall observers are useful. The student will find information about rain-gauges, deductions for dry seasons, amount of storage required, gauging streams by means of rectangular and V-notches, floats, current meters, &c. A deduction of 20 per cent. (one-fifth) must be made from the average rainfall to obtain the mean fall of three successive dry years, and a further deduction for evaporation some 12 in. or 15 in. In the next chapter supplies requiring storage are considered, and many useful rules are given by which the storage capacity can be found. The construction of storage reservoirs, dams, slopes, concrete walls, &c., are described in an elementary manner, after which masonry dams are described and illustrated and the stability of the dam mathematically discussed and its dimensions ascertained. The mathematical principles of resistance to sliding and crushing, triangular and trapezoidal sections are pointed out. Other chapters deal with purification of water, service reservoirs, flow of water through pipes, distributing systems, pumping machinery, &c. Mr. Middleton's work will be found to contain in a succinct manner the elementary principles necessary to be mastered before undertaking the water supply of any urban or rural district. The work is illustrated with plans, and is well printed.

We have received from Mr. Peter Stuart, F.R.S.A., an interesting souvenir of the visit of the Congress of Sanitary Engineers to Stuart's Granolithic Stone Company's Works in Glengall-road, Millwall Docks, on May 2 of the present year—a meeting fully reported in our issue of May 8, p. 643, last volume. The memento takes the form of a large and very clear photograph of the group of about one hundred members of the Sanitary Inspectors' Association assembled in the extensive grounds, the host, Mr. P. Stuart, the president, Mr. Isaac Young, and the hon. secretary, Mr. E. Tidman, being easily distinguished. In the foreground and all around are piled specimens of granolithic paving and flooring, briquettes, voussoirs, and lintels, the finished products of the firm.

Giovanni Focardi, of Florence, the well-known sculptor of realistic groups and caricatures, has just died at the age of sixty-one. Among his works are "I'm first, sir"—two little newscasters, "You Dirty Boy," "Sweet Rest," exhibited at the Academy, and "Othello and Desdemona."

The National University of Buenos Ayres have published a pamphlet describing exhaustive tests made by Mr. Emilio Palasio to ascertain the resistance of Argentine timber. The experiments bear on twenty-two different kinds of timber, and comprise tensile tests, compression and shearing tests with and across the fibre, and bending tests. The pamphlet is published by the Imprenta de la Revista Técnica, Moreno 463, Buenos Ayres.

BRIGHTON BUILDING EXHIBITION AWARDS.

THE following are the awards made by the jurors appointed by the committee:—

The Silver Cup: The Art Pavements Decorations, Ltd.

CLASS I.

Gold Medal, The Art Pavements, Ltd.; Bronze Medal Messrs. Mead Bros. and Messrs. Elliott and Son, Hastings; Diploma, The Crowborough Brick Co.

CLASS II.

Silver Medal, Messrs. Gilkes and Son; Bronze Medal, Messrs. Perry and Sons, Duke-street; Diplomas: Mr. Boekbinder and The Sussex Cement Co.

CLASS III.

Diploma, The British Uralite Co.

CLASS IV.

Gold Medal, Messrs. Morris and Co.; Diplomas: Mr. A. W. Loomes and The British Challenge Glazing Co.

CLASS V.

Silver Medal, Messrs. Elliott, of Caversham; Diplomas: The Karri Co. and The Lift and Hoist Co.

CLASS VI.

Gold Medal, Messrs. George Jeannings and Co.; Diplomas: Mughan's Geysers (E. Long and Co.), Messrs. E. G. Brown, Ltd., and Mr. Shoemith.

CLASS VII.

Silver Medal, Messrs. Yates, Haywood, and Co.; Bronze Medals: Mr. Saunders, of Black Rock, and The Elphicas Fire Alarm; Diploma, Mr. F. V. Hadlow.

CLASS VIII.

Diploma, Mr. Phillips, for photographs.

CLASS X.

Diploma, Messrs. Foulger and Co.

CLASS XI.

Bronze Medal, The Herne Hill Rustic Works.

CHIPS.

The new town hall and council offices at Horbury, near Bradford, were formally declared open on Friday. The building has been erected at a cost of more than £6,100.

The work of relaying the corporation's tramways at Gloucester in connection with their conversion to electric traction is about to be commenced.

The corner-stones were laid on Saturday of a new church which is to be built at the Whaley Bridge end of the parish of Chapel-en-le-Frith. The building, which will be named Christ Church, will be of a plain character, and is estimated to cost about £500, and seat about 250 persons. A tower will be added in course of time.

The Ordnance Survey have issued a cheap map of the Edinburgh district, on the scale of four miles to the inch, folded in covers. It embraces a dozen counties, and is printed in black and white, with the main roads in colour.

The Right Rev. Dr. Whiteside, Roman Catholic Bishop of Liverpool, laid, on Sunday, the foundation-stone of a new Roman Catholic school and chapel in Windermere-road, Leigh, Lancs. A site of 3,800 yards has been secured, and the new premises will occupy the northern half of the site, leaving the other half available for a future church and priest's house. The new building will be of two stories. The upper story will be used as a chapel, and will accommodate 600 people. The school on the lower story will provide accommodation for 160 infants and 90 mixed scholars. The cost of the building alone, exclusive of land and furniture, will be £5,500.

A new Roman Catholic church at Walworth, S.E., was opened on Michaelmas Day. It is built of brick with facings of stone from Portland and Bath. Early English in style, it was designed by Mr. F. W. Tasker, A.R.I.B.A., and every inch of the ground has been utilised to afford the largest floor-space for the congregation, the full capacity being for 600.

A Local Government Board inquiry was held at the Council House, Birmingham, on Tuesday, by Major J. Stewart, R.E., into an application by the city council for permission to borrow £13,000 for the purchase of land and of certain water rights at Netchells for the purpose of improving the river Rea, £14,000 for the purchase of land at Little Bromwich for the provision of a public park, £3,850 for the purchase of three houses in Jamaica-row for market purposes, and £57,850 for works of sewerage and surface water drainage.

After many delays the Dean and Chapter of Exeter have finally approved the inscription to appear upon the Richard Blackmore Cenotaph in their cathedral. This memorial, the carrying out of which was placed by the committee in the hands of Mr. Harry Hems, of Exeter, is now in an advanced state in that well-known sculptor's studios. It includes a portrait of the novelist executed in statuary marble, and will be placed close to the north-western entrance to the cathedral below a small window which has been filled with stained glass as a further memorial.

*Water Supply: A Student's Handbook. By REGINALD E. MIDDLETON, M.Inst.C.E., M.Inst.Mech.E., F.S.I. London: Charles Griffin and Co., Ltd., Exeter-street, and.

OBITUARY.

GEHEIMRATH FRIEDRICH LIPPMANN, Director of the Royal Academy of Engravings in the Berlin Museum, who died on Sunday, aged 63 years, was probably the first authority on his own department of art. During the past seven-and-twenty years he had spared no labour in arranging the originally chaotic collection of engravings in the Berlin Museum so as to make it a model of what such a collection should be. He strove to secure the acquisition of the best examples of the engraver's art for the Berlin Museum, and to substitute better ones for those which were inferior. Dr. Lippmann especially directed his efforts to perfecting the Dürer collection, which is now the most important next to that in the Albertina in Dresden. In 1882 the Duke of Hamilton's collection of manuscripts was acquired, and with it Botticelli's illustrations to Dante's *Divina Commedia*. Dr. Lippmann also assisted in the publication of reproductions of drawings by Dürer, Rembrandt, and other masters.

CHIPS.

The award of Mr Thomas Blashill, F.R.I.B.A., in an arbitration held in connection with the erection of University Hall, Clare Market, has now been published. The contractor, Mr. Howell J. Williams, claimed £3,061 17s. 2d., and has been awarded £476 14s. 6d. The claimant conducted his own case, and the architect of the building, Mr. Maurice B. Adams, F.R.I.B.A., acted on behalf of the trustees. No solicitors were employed.

A monumental slab has been placed in Durham Cathedral to mark the burial-place of Richard De Bury, Bishop of Durham from 1333 to 1345. He was a prelate distinguished for learning and charity, founded a large public library at Oxford for the use of students of Trinity College, and was said to have possessed more books than all the other bishops in England. The new memorial, which has been given by the De Bury Society of America, is of white marble, and bears on its face a sculptured representation of the bishop in his robes in bas-relief.

It has been decided to erect a permanent memorial in the Cathedral of Norwich to the late William Cadze, a well-known surgeon. Subscriptions are limited to one guinea, and confined to the medical profession.

Mr. F. W. Pomeroy has been intrusted with the execution of the statue in Liverpool of the Right Rev. Monsignor Nugent, which is to contain allegorical figures and groups of figures descriptive of incidents in the labours of Monsignor Nugent on behalf of the suffering and homeless poor of that city.

Lord Methuen will open to-morrow (Saturday) a new parish-hall at Bethnal Green, which has been erected at a cost of £3,000.

On Thursday next, the 15th inst., the great equestrian statue of General Sherman will be unveiled at Washington. The statue is the work of a Danish sculptor Rohl-Schmidt, who died three years ago while at work on it, and several Scandinavian artists, among them Stefan Sinding, have assisted in carrying out the designs in relief and the side figures representing War and Peace.

Last week the Bishop of Barking opened the new and permanent church of the Felsted School Mission at the Victoria Docks. The edifice, which is called the Church of the Ascension, has been built after plans by Messrs. J. E. K. and J. K. Cutts, and will seat 550 people. Owing to the treacherous nature of the ground the building has cost over £5,200.

The first train entered Coomassi on Thursday. A few details of the railway, of which for the present at least that place is the terminus, may be of interest. The total length of the line from Sekondi on the coast up to Coomassi, is 180 miles. Work was begun at Sekondi in 1898, but the first section of 40 miles to Tarkwa was not finished till 1901. The work has since proceeded far more rapidly, and the 140 miles of line between Tarkwa to Coomassi were laid in 27 months. The gauge is 3ft. 6in. and the line is single; it is laid on steel sleepers, the bridge being also of steel with concrete piers. The cost has been about £1,000,000, and the construction has been carried out by the Gold Coast Colony Government itself, with Messrs. Shelford and Son as consulting engineers. In addition to the line already completed, which serves the goldfields at Tarkwa, Obuassi, and Akrokerrri, branches are to be made forthwith to facilitate the development of the fields at Prestea and Prinsu.

The City Corporation have decided to invite competitive designs for the reconstruction and lowering of Southwark Bridge, with instructions that they are to be as "artistic as possible." A proposal to refer to a committee the question of allowing the L.C.C. electric tramway lines from South London to be continued over the bridge was negatived.

Building Intelligence.

BRISTOL.—The David Thomas memorial church was reopened on Sunday after being for some time in the hands of the contractors. During the day a memorial window, in recognition of the first minister, the Rev. W. Clarkson, was unveiled. Under the supervision of Messrs. Maynard, Froud, and Green, architects, of Bristol, a gallery has been placed in the west end of the church, and further additional room for pews has been afforded by removing the organ and rebuilding it in a new elevated chamber constructed to the south of the apse, above the deacon's vestry. In all, accommodation has been found for 150 more people, and other alterations have been carried out as part of the scheme, for which Messrs. E. Walter and Son were the general contractors.

CREW'S HOLE, BRISTOL.—The foundation-stone of the church of St. Aidan's, Crew's Hole, Bristol, was laid on Saturday by the Dowager Duchess of Beaufort. The church will meet the requirements of a large district on the eastern side of the city. The site is a prominent and exposed one on Nag's Head Hill, overlooking the valley of the Avon, and was purchased by the Church Extension Committee in 1902. The church of St. Aidan's, when completed, will seat 755 worshippers, and the plans for it have been prepared by Mr. G. F. Bodley, R.A. It will be built at an estimated outlay of £7,300, towards which £3,280 has been raised. The chancel, two bays of the nave, with the south aisle and morning chapel and vestries, will be proceeded with at once, and contracts for this work amounting to £1,873 have been signed by Messrs. Cowlin and Sons, of Bristol. The furniture, fittings, and contingencies will increase this amount to £5,260.

HIGHAMS PARK.—The foundation-stone laying ceremony of the Highams Park United Methodist Free Church took place on Saturday last. The design is in a late period of Gothic freely treated. The facings are in pressed red bricks, and the dressings are in white Costessey work. The block comprises church with transepts and apse, and two vestries, and the usual conveniences. The contract amount is £1,828. This building will form the school when the future church is erected, and is only the first portion of a large scheme. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's-inn, Strand, London, W.C.

HUNSLLET, LEEDS.—The new workhouse, situated near the junction of Wood-lane and Wakefield-road, at Rothwell Haigh, was formally opened on the 1st inst. The site comprises 18½ acres, providing space for future extension, the present accommodation of the workhouse and infirmary being 450. The administrative portion of the buildings, stores, laundry, boiler-house, &c., have also been designed on a scale sufficient for a building twice the size. The buildings consist of six groups—the entrance buildings, main building, laundry and boiler-house building, infirmary, lunacy building, and isolation hospital. The main building has the administrative block placed in the centre; and connected with this by glazed conservatory corridors are the pavilions for the aged and able-bodied classes. The laundry and boiler-house buildings are placed in a central position between the main building and infirmary. The infirmary is connected with the main building by a covered corridor; it has a nurses' home in the centre, separating the male and female pavilions. The maternity block is between the infirmary and the main building, and the lunacy block for 36 inmates consists of accommodation for male and female attendants in the centre, with epileptics on each side on the ground floor, and imbeciles above. The isolation hospital is also a complete building in itself. The aged married couples' cottages are on a high part of the site, near Rothwell Haigh, entirely separate from the main buildings. The buildings are lighted throughout by electricity, and there are two electric lifts at the centre of each infirmary pavilion. The total cost of the building, including the site, is approximately £85,850, or £182 per bed. The architect was Mr. J. H. Morton, F.R.I.B.A., of South Shields, and the builders were Messrs. Harold Arnold and Son, of Doncaster. The consulting engineers for the whole of the electrical work were Messrs. Shepherd and Watney, Greek-street Chambers, Leeds.

METROPOLITAN ASYLUMS BOARD.—At the meeting on Saturday of this body letters were read from the Local Government Board inclosing copies of orders which they had issued authorising the erection of additional buildings at Joyce (Green Hospital at a cost not exceeding £8,680, and the borrowing of that amount; and the erection of cottages at the Brook and Grove Hospitals respectively for the accommodation of the resident engineer at a cost of £1,070. Plans were approved for the reconstruction of the South-Eastern Hospital buildings at the estimated cost of £123,000. The scheme provides that the 288 beds in the temporary buildings shall be replaced by 385 in new permanent buildings, bringing the total accommodation for patients up to 488 beds, and it includes the extension and remodelling of the administrative block, and the provision of additional accommodation for nurses, female servants, and the male staff.

SHIREHAMPTON, BRISTOL.—The foundation-stone of the new parochial hall at Shirehampton, Bristol, was laid on Saturday. The hall is designed to accommodate 500 persons, of whom 370 would be seated on the ground floor, and the rest in the gallery at the end. The internal dimensions of the building are 65ft. by 30ft. There is a stage the full width of the hall, 11ft. from front to back, and raised about 3ft. above the floor. Caretaker's rooms are provided. The premises will be heated by hot water. The apparatus will be supplied by Messrs. Crispin and Son. The building has been designed by Mr. F. High Bond, F.R.I.B.A., of Bristol. The contract price for the building is £2,715. The contractor is Mr. C. A. Hayes, of St. Thomas-street, Bristol. Mr. James Long is clerk of the works.

STOCKPORT.—The chairman of the Board of Guardians of the Stockport Union, laid on Monday the foundation-stone of a new infirmary for workhouse patients. The site is at Stepping Hill, near Hazel-grove, some 26 acres of land having originally been purchased for the building of a workhouse to supersede the present workhouse at Shaw Heath, Stockport. The larger scheme was, however, abandoned, and it was decided to retain the present workhouse, and to obtain the necessary accommodation by placing the children in cottage homes apart from the workhouse, and by the erection of a new infirmary. Accommodation is to be provided in the new building for 320 patients and 36 nurses. The building contract was let for £39,980, and it is expected that furnishing and other expenses will bring the total to between £40,000 and £50,000.

WOLVERHAMPTON.—The Mayor opened on Monday the new wholesale covered market, which has been erected on a portion of the market ground in the centre of the town at a cost of £16,850. The new building adjoins the corporation cold stores, and is constructed of local brick, relieved with terracotta facings, and roofed with tiles. The roof is carried on girders supported by stanchions. On the main roof are three small turrets and a larger one, which act as ventilators, and break the monotonous line of the roof. The internal arrangement, in addition to providing floor space of 16,461sq.ft., available for letting in small lots, allows of permanent covered stands for wholesale dealers, with basements below and office accommodation above. The offices can be approached from the main staircase leading to the balcony, running the full length of the offices, or by a separate spiral staircase. Six of the stores have basements, with private doors leading into the space at the rear, to be used to facilitate the delivery of goods and the storage of empties. Ample roadways are formed, the widest being 20ft., and paved with sandstone cubes on 6in. of cement concrete; while the remaining floor space is paved with mastic asphalt on a similar bed of concrete. Six of the basements are reserved for the purpose of ripening bananas and storing empties. The plans have been prepared by Mr. George Green, the borough engineer, and the work, which has taken nearly three years to complete, has been executed by Messrs. George Cave and Sons, of Wolverhampton.

The corner-stone of a new church in Whittaker lane, Heaton Park, Manchester, to be named the Church of St. Hilda, was laid on Saturday. The church will cost £3,700, and will provide accommodation for some 315 persons. Later on it is intended to add a chancel, at an additional cost of some £2,000.

Engineering Notes.

GIGANTIC SIDING AT NORTHALLERTON.—The directors of the North-Eastern Railway Company have decided to construct a colossal siding for dealing with goods traffic at their Northallerton station on the main line from London to Edinburgh. The detail drawings have been approved, and provide for a siding which will be the largest in the world, and a model village of 500 houses for the workmen to be employed in the shunting operations. All this is estimated to cost £520,000. Sufficient land has already been secured from Northallerton to Longlands cabin between the main line and the Melmerby branch, and it is here that the siding will be made on good ground. It will have two gradients, one falling north and the other south, to accommodate the shunting operations. This immense siding, which will be in the V-shape, with Northallerton at the narrowest part, will act as a central collecting station for trains.

RAILWAY IMPROVEMENTS IN BIRMINGHAM.—A considerable improvement is in contemplation by the London and North-Western Railway Company upon the line between the north end of the tunnel at New-street Station and Monument-lane. The line between the Harborne Junction and New-street will be widened so as to permit of an additional set of metals being laid down. A new platform is to be erected at Monument-lane Station. The land required by the company for the completion of the scheme has been scheduled, as well as some fifty or sixty houses which will have to be demolished. The company will have to provide, under the Artisans' Dwellings Act, new houses near the city boundary at Soho. The work will be commenced by the end of the month. The Great Western Railway Company are already engaged upon important improvements upon their lines in Birmingham and the neighbourhood. The scheme for the extension of the lines and the station at Hockley has been completed, and preparations are being made for widening the line between Solihull and Birmingham. This will involve a rearrangement of the stations at Handsworth, Soho, Snow Hill, Bordesley, Small Heath, Acocks Green, and Olton. Snow Hill Station is to be reconstructed, and this work, together with the widening of the lines, will cost about a quarter of a million of money. The work at Hockley cost about £100,000, and a similar sum will be required for the new station at Tyseley, together with the provision of a locomotive department, with yard, at Small Heath. The arrangements for the commencement of the work in North Warwickshire are nearly finished. At Solihull and Knowle the stations have already been enlarged. The total estimate of the work undertaken in the county by the Great Western Company is about £1,000,000.

The population on the south side of Glasgow is growing so rapidly that within the last few years a number of new churches have had to be erected. The last one to be built has been put up by the extension committee of the Church of Scotland on a site at Newlands. The church, which has accommodation for 400 people, and cost £1,000, was opened for public worship on Sunday.

A large clock is about to be erected in the new Victoria Hall, Ellon, Aberdeenshire. It will have three large illuminated dials, and strike the hours. Messrs. John Smith and Sons, Midland Clock Works, Derby, are carrying out the work under the instructions of Mr. William Davidson, architect, Ellon. The same firm made a similar clock some years ago for Mintlaw, a neighbouring place.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied their patent Manchester grates to the new police buildings, Llanfairfechan.

Designs have been approved for the new Twickenham-green Baptist church and schools. The estimated cost is about £5,500. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's-inn, Strand, London, W.C.

The Southwark Borough Council have resolved to pave Marshalsea-road, through which thoroughfare the London County Council are now constructing a connecting link of electric tramways, with wood blocks, at a cost, as estimated by the borough engineer, of £1,937 15s.

In the village of Gilstead, near Bingley, on Saturday, memorial-stones were laid of a new Wesleyan chapel, which is being built from plans prepared by Mr. W. R. Nunn, architect, Bingley, to accommodate 250 persons, the cost being estimated at £1,300.

PROFESSIONAL AND TRADE SOCIETIES.

THE SOCIETY OF ARCHITECTS.—The following is the full list of nominations for officers and members of the Council for the year 1903-1904:—President, *Walter W. Thomas, Liverpool; vice-presidents (two), F. A. E. Pridmore, London, and *G. Gard Pye, London; honorary secretary, *Ellis Marsland, London; honorary corresponding secretary, *W. R. Mallett, London; honorary treasurer, *H. G. Quartermain, Merton. Council (thirteen nominations, twelve seats): *R. G. Bare, London; G. E. Bond, Rochester; *F. W. Chancellor, M.A., Chelmsford; C. Cole, Exeter; *W. Cooper, Hastings; A. Curry, Jersey; *J. W. Dyson, Newcastle-on-Tyne; *H. E. Knight, London; J. C. Jackson, London; *F. W. Macey, London; D. Morgan, F.R.I.B.A., Cardiff; *B. R. Tucker, London; and R. F. Vallance, F.R.I.B.A., Mansfield. [An asterisk (*) denotes nomination to office previously held; a dagger (†) proposed change of office.]

THE GLASGOW INSTITUTE OF MEASURERS.—The twenty-third annual meeting of this institute was held in the Building Trades' Exchange, Glasgow, on Monday, Mr. James D. Herbertson, president, in the chair. The annual report of the council on the business of the past year was submitted and adopted. The number of members is now 62, besides one honorary member. A donation of £2 2s. was again made to the Technical College for prizes in the building construction classes. The treasurer submitted a statement of his intrusions during the year, the gross funds amounting to £479 2s. 1d. The office-bearers for the ensuing year are:—President, Mr. James D. Herbertson; vice-president, Mr. John Baxter; secretary and treasurer, Mr. Thomas N. Hill, F.S.I., 180, Hope-street; auditors of professional accounts, Messrs. John Muirhead and John H. Allan; other members of council, Colin Young, Charles Marshall, George B. Walker, James Cameron, Thomas Duff, Anthony Purdie, and John Currie.

OHIPS.

The new storage reservoir which has been erected for the corporation of Ipswich in Park-road, from plans by Mr. Hamlet Roberts, their waterworks engineer, will be opened on Friday in next week, the 16th inst.

At Monday's meeting of Aberdeen Town Council, Mr. Samuel Milne, at present assistant gas engineer, was appointed engineer of the corporation gasworks, the vacancy being occasioned by the resignation of Mr. Alexander Smith, the salary to be £350 per annum, rising by annual increments of £25 till it reaches £500.

The directors of the Great Northern Railway Co., Ireland, at an extraordinary meeting held on Tuesday, passed resolutions authorising that company under the Castleblayney, Keady, and Armagh Railway Extension of Time Act, 1903, to subscribe £350,000 for the construction of the Castleblayney, Keady, and Armagh Railway, which will now be proceeded with. A Bill for the construction of a line from Drogheda to Mullingar in connection with the steam-packet service to that port organised by the Lancashire and Yorkshire Railway was passed last Session of Parliament, the capital for which is £350,000. The engineer for both these lines is Sir Benjamin Baker, C.B., K.C.M.G., and the contracts for construction, amounting to £613,000, have been placed in the hands of Mr. Robert Worthington, J.P., of Dublin.

On Saturday afternoon the memorial-stone of a new church for the Airdrie Evangelical Union Congregational Church was laid. The building is situated close to the public park, will be seated for 500, and will cost £2,500.

The Bishop of Derby reopened on Wednesday the ancient parish church of Normanton-by-Derby, which has recently been enlarged and renovated at a cost of £2,000.

A new mission church of stone is being built at Toronto, near Bishop Auckland, in place of an iron building which was blown down in the gale of February last. The foundation-stone is to be laid to-morrow (Saturday) afternoon. Accommodation is provided for 250 sitters. Mr. Thos. Hilton is the builder, and Messrs. Hicks and Charlewood, of Newcastle-on-Tyne, are the architects.

The new Marlborough Theatre, Holloway, was opened on Monday night. The new building, of which Mr. Frank Matcham is the architect, is spacious. A feature in the planning is the throwing back of the upper circle, so as not to project over the dress-circle, thus enabling the large gallery to be brought well forward. The stage measures 43ft. by 76ft.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LI., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—R. H.—C. E.—Architect.—W. T. (Brighton).
—H. V. G. and Co.—Engineer.—P. P. and Son.

Correspondence.

PROPOSED RECONSTRUCTION OF THE WAKEFIELD CATTLE MARKET.

To the Editor of the BUILDING NEWS.

SIR,—The committee disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: No guarantee that a professional assessor will be appointed, or that any of the designs submitted will be accepted. Premiums insufficient.

Architects are requested to abstain from competing unless they receive a further communication to the effect that the conditions have been satisfactorily revised.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

Competition Reform Society,
10, Gray's Inn-sq., London, W.C., Oct. 5.

LONDON BUILDING ACT, 1894.

SIR,—In May last we received a notice from the London County Council stating that the

portico of a house at the West-end, belonging to a client of ours, was in a dangerous condition, and requiring that it should be taken down forthwith. A builder was at once employed to do the necessary work, and the total cost of the repairing was £7 10s. Shortly after this we received an application from the district surveyor for his fees relative to the matter, amounting to £1 16s. 3d., and although this seemed to us, under the circumstances, a very outside fee, it was paid at once. Yesterday morning, more than four months after the event, we received an application from the County Council for another surveyor's fee, amounting to £1 2s. 6d., and also for fees payable to the Council, 6s. 3d.; and this was coupled with a courteous intimation that unless the amount was paid within seven days legal proceedings would be taken. In other words, the County Council consider that it was necessary, forsooth, that two separate surveyors should be employed on this trifling matter, at a cost amounting altogether to £3 5s., or nearly 50 per cent. of the amount expended on repairs! Comment is needless.

No doubt it might be retorted on the part of the County Council that the Act provides for such expenditure. So much the worse for the Act. But we cannot for a moment imagine that it was the intention of the Legislature to countenance such proceedings as these.—We are, &c.,

QUAYLE AND OUVRY.

15, Arundel-street, W.C., Oct. 7.

In addition to the 30,000 which is being spent by the Glasgow and South-Western Railway Company on rebuilding the quay-walls, raising the crane foundations, and erecting a new 50-ton crane at the pier-head berths at Troon Harbour, a sum of £5,000 is being expended on a hydraulic system of wagon haulage.

At the annual meeting, in Newcastle-on-Tyne on Monday, of the Governors of the Durham University College, it was reported that £50,000 had been raised, which would enable the council to complete the College buildings (with the exception of the central tower), as a memorial of the late Lord Armstrong, and to erect a statue of him in the grounds of the Natural History Society's Museum, Newcastle. The work of completing the buildings is to be undertaken without delay.

The memorial to the late Mr. Joseph Cowen, newspaper proprietor, Newcastle-on-Tyne, and for many years Member of Parliament for that city, will take the form of a statue to be erected in Newcastle. The sum aimed at is £3,500.

At St. Andrew's Church, Southport, on Sunday, a memorial window was unveiled. In the window is depicted the "Call of St. Andrew" by the Lake of Galilee, the design being by Mr. A. L. Moore, of London, with Mr. W. Gilbee Scott, F.R.I.B.A., of London, as advisory architect.

The new London and North-Western Railway Company's line from Leigh, via Park-lane, to Wigan and Blackpool was opened on the 1st inst.

A new police station which has been erected in Mill-street, Bradford, Manchester, was opened on Friday. The station has cost £25,000, and will take the place of the old headquarters of the C Division in Fairfield-street, as well as of several substations. The building contains separate departments for police and firemen, and housing accommodation for several men of both forces. In the police department there are thirteen cells, and these, like the rest of the building, are lighted by electricity. It has been built from plans by Mr. H. Price, the city architect.

A steadier tone characterised the market at Tokenhouse-yard Mart last week, and though the number of properties was not large, there was a general improvement. The most important dealing was with the Windsor Racecourse, covering an area of nearly 122 acres, and held for nineteen years at a rental of £700, which sold for £22,000. The sales at the Mart during the week amounted to £67,637. For the corresponding week of last year the figures were £53,376.

A memorial tablet to the late Sir Frank Green, Lord Mayor of London during the year 1903-1901, was unveiled on Monday at the church of St. James, Garlickhithe. The tablet, which is of Verona marble, is set in a framework of alabaster, adorned with carving and gilding. Above the tablet are the arms and crest of the late Sir Frank Green.

A bronze statue of the late Queen Victoria is to be erected in front of the Royal Military Academy, Woolwich. The statue will be 8ft. high, mounted upon a red polished granite pedestal, decorated on the four sides with bronze reliefs, depicting the Royal Artillery in the four several engagements, "Crimea, Indian Mutiny, Afghanistan, and South Africa." Mr. Henry Price has been commissioned to execute the work.

Intercommunication.

QUESTIONS.

[12010].—**Smoked Bricks.**—Smoked bricks taken from an old chimney flue have been built in on the inside of new house walls, and I am afraid the smoke will show itself through the plaster and spoil any decoration put thereon. I shall be glad if any of your readers can tell me of a remedy that will kill the smoke stains in the bricks.—J. T. G.

[12011].—**Electric Lighting.**—I have to light a good-sized house in the country, requiring about 500c.p. lights, 30 of which would be in use at once, or about 34. Being only an amateur and not able to incur expense of a large battery of accumulators, I propose using 2H.P. oil-engine and a second-hand dynamo rated at 25amp. 55v. I should be obliged by any criticism of my estimate, also by information on the following points: 1. Can I use Nernst lamps, and are they reliable? 2. Can I charge a small 100amp-hour battery of 30 cells while drawing off current from it i.e., use it merely as a regulator? 3. Can I use any electric governor on oil-engine, so as to cut off power when load is lightened? 4. What is the simplest switch-board, embodying all essentials, and where can I get information as to instruction and wiring generally? 5. Do I need a compound-wound dynamo? 6. Would a car motor be reliable enough for daily wear? 7. Can I provide for upstairs lights after engine stops by little 10v. lights and accumulators in each room, say six sets, instead of setting up an accumulator battery?—DYNAMO.

[12012].—**Level.**—Will anyone acquainted with the use of and adjusting surveying instruments give me a simple method of putting in adjustment an ordinary dumpy surveying level, and of proving when so adjusted that it is correct?—DUMBY.

REPLIES.

[12002].—**Norwich.**—By an obvious slip, your correspondent "E. W. H. P." in his most interesting sketch of Norwich (Sept. 18) refers to the late Sir G. Gilbert Scott, R.A., as the architect for the new R.C. Cathedral in St. Giles' at that city. As a matter of fact, it was the great architect in question's talented son and namesake, the late George Gilbert Scott, F.S.A. (who also designed the clever church of All Hallows, Pepper-street, Southwark, S.E.), who was the architect of the exceptionally fine edifice in question; and it was under him the works were commenced and continued until his lamented and all-too-early death. The late Sir G. Gilbert Scott, perhaps the greatest power and organising architect of the last century; George Edmund Street, R.A., the hardest working and quickest drawer of details the architectural world probably ever saw; and Benjamin Ferrey, F.S.A., by no means the least (mark his church of St. Stephen, Rochester-row, Westminster, S.W., one of the first [A.D. 1830] of those great Gothic revival produced, and still worthily holding its own)—for as a man he was as sweet in disposition as he was earnest in his work. These, then, were three of the most prominent men of their profession who steadily remained—throughout the whole of their respective careers—faithful to the Mother Church of England. Architects, admittedly equally endowed, devoted their talents to R.C. work—(we recall the names of Pugin, Haddfield, Hansom, Goldie, and others)—with much brilliant success in that particular sphere. The names of Scott, Street, and Ferrey, however, will always be associated with Anglican, and not Roman, ecclesiastical work.—HARRY HEMS.

[12008].—**Normandy.**—The cost of living at good second-rate hotels in Cherbourg is 6 francs a day, inclusive (not exclusive) of wine. The particular hotel mentioned in my notes last week (the Hotel de Paris) faces the Quay, and is largely patronised for their meals by officers of the garrison. Travellers who may stay there do not fail to notice the capital old handrail (late 18th-century work) that winds story after story most gracefully up the tall, narrow staircase, and is excellently moulded to suit the grasp of those using it.—HARRY HEMS.

The members of the water committee of the city council of Birmingham, accompanied by the engineer, Mr. Mansergh, visited Wales on Friday for the purpose of inspecting the Liverpool waterworks at Lake Vyrnwy and Birmingham's new sources of supply in the Elan Valley. On arriving at Llanfyllin, the committee drove a distance of about ten miles to Lake Vyrnwy, the district from which Liverpool obtains its water. In the afternoon they visited the works, and remained the night at Vyrnwy. On Saturday morning the party proceeded to Beravader, and in the afternoon they inspected the filter-beds and other works at the end of Elan Valley.

At the last meeting of the Court of Common Council, Mr. Horncastle, the Chief Commoner, stated that a portion of the Roman external wall which went round the City, and was of the date of the 5th century, had been brought to light during the excavations at the Sessions House in the Old Bailey, and was in a marvellous state of preservation. The excavations had also revealed at the north end of the site an archway, which was apparently a portion of a subterranean passage-way, which at one time connected New-Gate, built about 1100, and the gaol.

At the Islington Town-hall, on Wednesday, Mr. H. Percy Bulnois, M.Inst.C.E., held an inquiry on behalf of the Local Government Board as to the views of the inhabitants on the memorial of the Islington Borough Council praying that the Norfolk-square area in the Essex-road, originally cleared ten years ago for the erection of dwellings under Part II. of the Housing of the Working Classes Act, 1890, might be kept as an open space.

LEGAL INTELLIGENCE.

SERIOUS CHARGE AGAINST A BUILDER.—At the West London Police-court on Saturday, Henry George Carey, 49, a builder, of 6, Windsor-place, Lower Weston, Bath, and Mary Carey, 36, his wife, were charged, on remand, with obtaining money by fraud from various tradesmen in Chiswick. Mr. Hanson, who prosecuted, stated that the defendants formerly lived at Chiswick, and had an account at the London City and Midland Bank. That account was exhausted in June, and since then they had been spreading a flood of worthless cheques over the district. In the end they went away, and a warrant having been obtained, they were arrested at Bath. Five witnesses, all shopkeepers, gave evidence to the effect that the female defendant gave them cheques in payment for goods purchased. Each cheque was of a higher value than the price of the goods, and the accused received the balance in cash. Most of the witnesses admitted that the defendants had on previous occasions presented valid cheques in payment of accounts. Mr. R. W. Barker, manager of the London City and Midland Bank, Chiswick Branch, stated that the male defendant had an account at the bank from November, 1902, to June, 1903, when it became exhausted. In all seventeen cheques had been returned by the bank. On August 14 the female defendant paid in £22, and on the following day drew it all out, and since then the bank had had no dealings with the accused. In reply to Mr. Pierron, who defended, the witness stated that in all £1,400 was paid into the account by the defendants from November, 1902, to May of the following year. Mr. Pierron said Mr. Carey was expecting money from a contract at Windsor, and would in time have met all the cheques. The magistrate committed the prisoners for trial.

ARBITRATION AT HEADLEY, HANTS.—At the Surveyors' Institution, Westminster, on Friday, before Mr. A. L. Ryde, sole arbitrator, the claim was heard of Professor Sonnenschein, of Birmingham University, against the War Department, in regard to a portion of land situated at Headley, which the War Office is compulsorily acquiring for the purpose of the erection of barracks, and the training of troops near Borden Camp, Wolmer Forest, Hampshire. Mr. Honoratus Lloyd appeared for the claimant, and Mr. Noble for the War Office. The claim was for £4,073, but after a consultation between counsel it was announced that a settlement had been arrived at, the claimant obtaining £1,875.

CHIPS.

The town council of Inverness elected, on Monday, Mr. John F. Smith, of Wolverhampton, as borough engineer and surveyor.

The joint drainage committee of Tottenham and Wood Green are having a brick sewer constructed at a cost of £27,000. Messrs. B. Cooke and Co. are the contractors, and the engineers Messrs. J. E. Murphy and W. H. Prescott.

The Scottish Court of Session having sanctioned the modification of the constitution of the Glasgow and West of Scotland College to permit of the election of a governor by the Glasgow Institute of Architects, an addition has been made to the board by the appointment of Mr. T. L. Watson, F.R.I.B.A., as the representative of the Institute.

The memorial statue of the late Mr. T. E. Ellis, M.P., which has been erected in the High-street of Bala, was unveiled on Wednesday. It stands on a pedestal 10ft. in height, and has been executed in bronze by Mr. W. Goscombe John, A.R.A.

On Saturday the Bishop of Peterborough dedicated a new chancel screen which has just been erected in St. John's Church, Leicester. The screen is the gift of Mr. and Mrs. Bunning, the donors of a peal of bells recently placed in the tower of this church at the cost of £1,000. The screen, which measures 17ft. between the chancel arch piers, is of wrought iron, and is mounted upon a base and steps of marble, of polished Belgian black and verde antico marbles. Above the screen is a cross. The whole of the work has been executed from designs by Mr. C. H. Löhr, by Messrs. Thomas Brawn, of Birmingham.

In our account of the opening, by the Bishop of Durham, of St. Chad's Church, Gateshead, no reference was made to the work done by Messrs. Emley and Sons, Limited, which included the paving of the whole of the aisles in stone and marble squares, and of the sanctuary in costly and highly polished marbles, the polished marble steps in the sanctuary and the floor and marble steps in morning chapel. The name of the donor was not Messrs. Easton, but Miss Easton.

On Thursday afternoon in last week memoria stones were laid in connection with the enlargement of the Copperhouse Wesleyan Sunday-school, Hayle. A new wing 20ft. by 22ft. is being added to the north side of the present schoolroom. Mr. S. Hill of Redruth, is the architect, and Messrs. R. Harris and W. Chinn are the contractors.

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ILLUSTRATIONS.

THE CROFT, ETCHINGHAM, SUSSEX.—GENERAL HOSPITAL, TUNBRIDGE WELLS.—KING'S LYNN GRAMMAR SCHOOL.—ST. PAUL'S CHURCH, LANDORE.—PROPOSED COTTAGES, LONG NEWTON.—BILLIARD-ROOM, BURNHOLM, YORK.—DESIGN FOR ENTRANCE TO A PUBLIC BUILDING.—SOUTH DOORWAY, ALL SAINTS, KIRTLING.

Our Illustrations.

THE CROFT, ETCHINGHAM, SUSSEX.

This house was built last year for Mr. T. H. Hornblower, on a charming site of some twelve acres, about one mile from Etchingham on the south side of the Burwash-road. The land slopes towards the south, and commands views over a wide stretch of country. In addition to the accommodation shown upon the ground floor there is a lower floor extending over the whole area, which is well lighted, owing to the rapid fall in the ground, and contains a large garroom, a workroom, dairy, &c. On the upper floors are ten bed and dressing-rooms. The house is built of red bricks, with Douling stone for the main entrance, &c., and the roof is covered with South-country tiles. The hall, which is 30ft. by 18ft., with a large bay window and a fireplace recess in addition, has oak beams and doors and an oak floor. There is a verandah-balcony at the ground-floor level with a flight of steps to the garden level. Mr. A. H. White, of St. Leonards, was the builder, and the architect was Mr. George Hornblower, F.R.I.B.A., of London. The drawing now illustrated was by Mr. T. Frank Green, and was exhibited in the Royal Academy this year.

TUNBRIDGE WELLS GENERAL HOSPITAL.

The large addition to this building, for which Mr. H. Percy Adams, Woburn-place, Russell-square, London, is the architect, comprises entirely new wards for all the patients. The existing old hospital will be utilised solely for administration purposes, and contains all the rooms for the committee, medical officers, matron, nurses, and servants, as well as the kitchen department and rooms for the hot water and heating plant. The new out-patient department is at one corner of the site, and entered by separate entrance from the goods-station road, and contains consulting rooms, examination rooms, large waiting-hall for patients; above the consulting rooms and dispensary (accessible for both out and in patients) is built the new children's ward, the cost of which has been defrayed by a special fund raised in memory of the late Queen's Jubilee. This ward will be a special feature of the hospital, as the walls are to be tiled with picture tiles telling nursery tales. The wards are built with the cross windows east and west, and the large windows at the end almost due south. Externally the buildings are of red brick, with stone dressings and tile roofs. Messrs. Jarvis and Son, of Tunbridge Wells, are carrying out the contract of about £22,000, the clerk of works being Mr. H. A. Taylor.

KING'S LYNN GRAMMAR SCHOOL.

The drawing by Mr. Basil Champneys, which we illustrate to-day, was exhibited at the Royal

Academy this last season. It shows the design which was made for a site in King's Lynn town: but since then the site has been altered, necessitating many changes in the scheme, so that the drawing must be considered in this light.

ST. PAUL'S CHURCH, LANDORE.

This church, which is now almost completed, will seat 600 adults, and consists of a nave, chancel, north and south aisles, with organ-chamber and clergy vestry, the choir vestry being placed in the basement. The site slopes considerably from west to east, and the space underneath has been utilised for a schoolroom and classrooms. It is built of thin-coursed grey Pennant stone from the Neath quarries, and red Hollington stone has been used for the dressings and tracery. The church is lined throughout with green Quarella stone. The roof is open to the apex, and the chancel is boarded and panelled, with moulded ribs, with carved and gilded paterae at the intersection, the main ribs being carried on carved and decorated corbels. It is seated with chairs, and the choir-stalls are executed in Austrian oak. The contract was let to Messrs. Weaver Brothers, of Manselton, Swansea, for £7,000. Mr. Bruce Vaughan, of Cardiff, was the architect.

COTTAGES AT LONG NEWTON.

The sketch for the above was in this year's Royal Academy, and is for the rebuilding of certain cottages which the Marquis of Londonderry recently acquired at Long Newton, the greater part of which is his property. A little delay is being caused with the commencement of the work owing to the scarcity of temporary cottages for the tenants, which have his lordship's great consideration. The buildings will be carried out in pressed brick, stucco, and green slates, and are situated between the church and school, and will add greatly to the village appearance, and face the high-road between Stockton and Darlington. Messrs. Harrison and Hunter, of Stockton-on-Tees, are the architects, who have also various farm buildings and other properties rebuilding on Lord Londonderry's Long Newton Estate.

BILLIARD ROOM, BURNHOLM, YORK.

This room is from the design of Mr. Arthur J. Penty, of Elingham House, Arundel-street, W.C. It was executed in oak with ebony panels over the chimney-piece. The carving is by Mr. Geo. W. Milburn, of York. The drawing was exhibited in this year's Academy.

DESIGN FOR ENTRANCE TO A PUBLIC BUILDING.

Mr. EDWARD CRATNEY, of Willington-on-Tyne, is the author of this design for a doorway to a public building, which has some degree of suggestiveness about it, with the recessed balcony above the porch, into which the steps extend. There is but very little space to accommodate expanding iron gate grilles behind the flanking columns of this porch, though these could be managed perhaps. Gates of some kind are necessary to exclude persons from intruding at night, presuming that the building is open to the street. Gates of this character do not look monumental in style, and seem somewhat out of keeping with such an entrance.

NORMAN DOOR, KIRTLING.

THE ancient church of Kirtling, about 5½ miles from Newmarket, still retains several features of its Norman origin—notably the fine doorway, which forms the inner entrance to the south porch, which is still in excellent preservation, the moulding and carving being exceptionally clear, including a grotesque figure of the Virgin over the doorhead. The church contains several monuments of the North family, the ancient seat of whom adjoins the church, surrounded by a deep moat: but only the main tower now stands to mark the site of what formerly was an extensive Baronial residence.

CECIL G. RAYNER.

An inquiry was held at Leeds Town Hall, on Friday, by Col. A. G. Durnford, at the instance of the Local Government Board, with reference to an application of the corporation for powers to borrow £220,000 in respect of electric lighting works.

An infirmary ward has been added to the workhouse at Newcastle-on-Tyne. The total cost is about £1,500, or about £18 per bed. Messrs. Newcombe and Newcombe, of Newcastle, are the architects; whilst the furnishings were seen to by Mr. Robson and Sons, Northumberland-street. The new ward was decorated by Mr. Moffatt.

COMPETITIONS.

CARDIFF.—The council of the University College of South Wales and Monmouthshire, at a special meeting on Tuesday, Sir Alfred Thomas, M.P., presiding, received a report from Sir R. Rowland Anderson, the assessor appointed to consider plans of college buildings sent in by competing architects. On the assessor's recommendation the council unanimously selected plans and designs by Mr. William Douglas Caröe, F.S.A., of Whitehall-place, London, who, under the terms of the competition, becomes architect of the proposed buildings, and, if they are not begun within three years, is entitled to a premium of 200gs. The buildings, for which a site has been given by the Cardiff Corporation in Cathay's Park, where a town-hall, law-courts, and other public premises are now being erected, are estimated to cost £224,355. The general scheme is to group around a great court various blocks of buildings, but the court will not be entirely surrounded. The area of the court is 52,000sq.ft. The blocks are arranged for the accommodation of the arts department, the Viriamu Jones memorial research laboratory, public health department, library, physics wing, women's department, and a great hall to seat 1,190 persons. The whole structure is designed to be architecturally in harmony with the other public buildings in the vicinity. The scheme permits of the erection of the buildings in sections, and the proposal is to proceed as soon as possible with the arts department, and to postpone the building of the remaining blocks, estimated to cost £140,942, until funds are available. The college building fund at present amounts to £70,000. The Cardiff Town Council, at a meeting on the same day, directed that £6,000 promised towards the cost of building the registry of the University of Wales on a site in Cathay's Park, also given by the corporation, be forthwith paid over in one sum to the university authorities.

LIVERPOOL.—At the meeting on Wednesday of the City Council, the Baths Committee submitted the following recommendation:—"That the design for the erection of baths on the George's Dock site marked No. 6 be approved, subject to the elevations and treatment of open space being amended to the satisfaction of the Baths Committee, and that the author of the design, Mr. Alfred Saxon Saell, F.R.I.B.A., 22, Southampton Buildings, Chancery-lane, London, be engaged to carry out the scheme, and that he be paid a commission of 5 per centum upon the original contract price of the building, in accordance with the terms of the conditions of the competition, and that an application be made to the Local Government Board for sanction to borrow the sum of £75,000 to carry out the work." The recommendation was adopted. The designs were on view on Monday and Tuesday in Room No. 31, Central Technical School, Byrom-street, Liverpool.

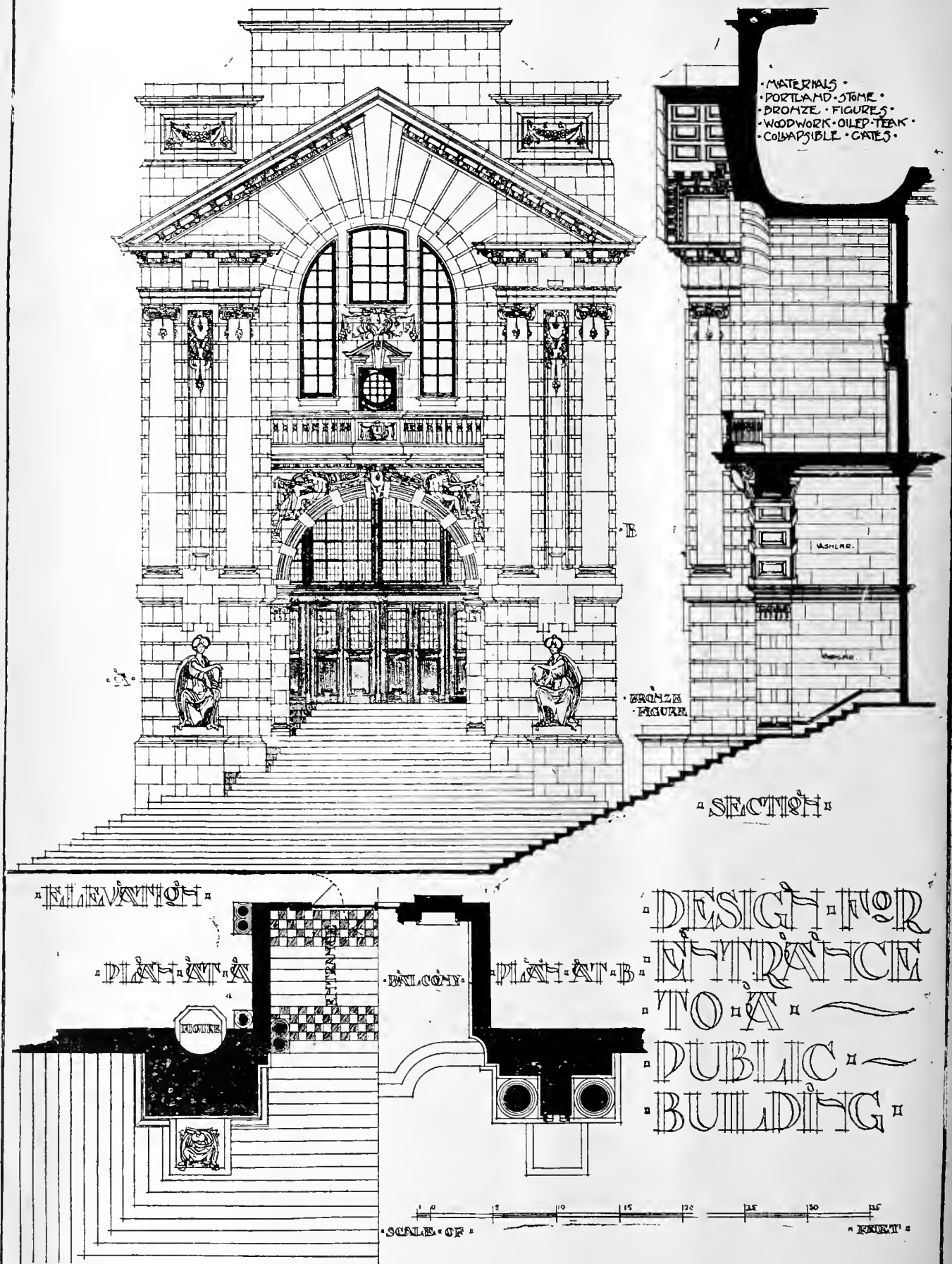
CHIPS.

Nine stained-glass windows have been placed in Bishop Russell's Chapel on the north side of Lincoln Cathedral, corresponding with those in Bishop Fleming's Chapel on the opposite side of the minster. The new windows chiefly bear the names and arms of sub-deans, and the design in each instance is an angel with outspread wings supporting a shield, with the arms encircled with colouring.

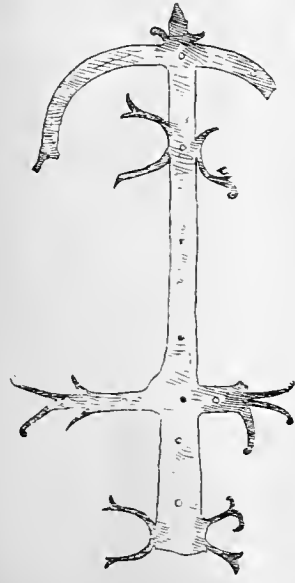
The town council of Brighton have obtained the sanction of the Local Government Board to the borrowing of £1,361 for the purpose of improving the Aquarium estate.

The condition of the steelwork in a number of Chicago office buildings was investigated some time ago by a number of architects. Mr. C. T. Purdy states that all the steel was found in a very satisfactory condition. The examination showed conclusively that if reasonably good care is exercised, structural iron in building work will not corrode. It also particularly emphasises the value of cement mortar in contact with iron as a preservative agent.

In the syllabus of the new school of architecture promoted by the newly-constructed Victorian University of Manchester, in conjunction with the Manchester municipal schools of technology and art and the Manchester Society of Architects, the students, under Professor S. H. Capper, have a first-year course indicated for such as intend to proceed to the Victoria University degree in the honours school of architecture. In a university course, however, which provides a complete education on the theoretic and academic side, no attempt will be made to interfere with the professional training which practical employment in offices of works must give.



South Doorway All Saints Kirkling Suffolk.



Detail of Wrought-Iron Hinge.

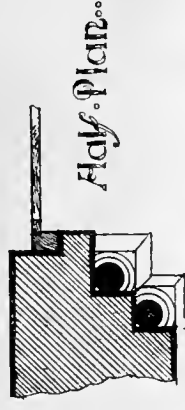


Details of Carving
in
Doorhead.

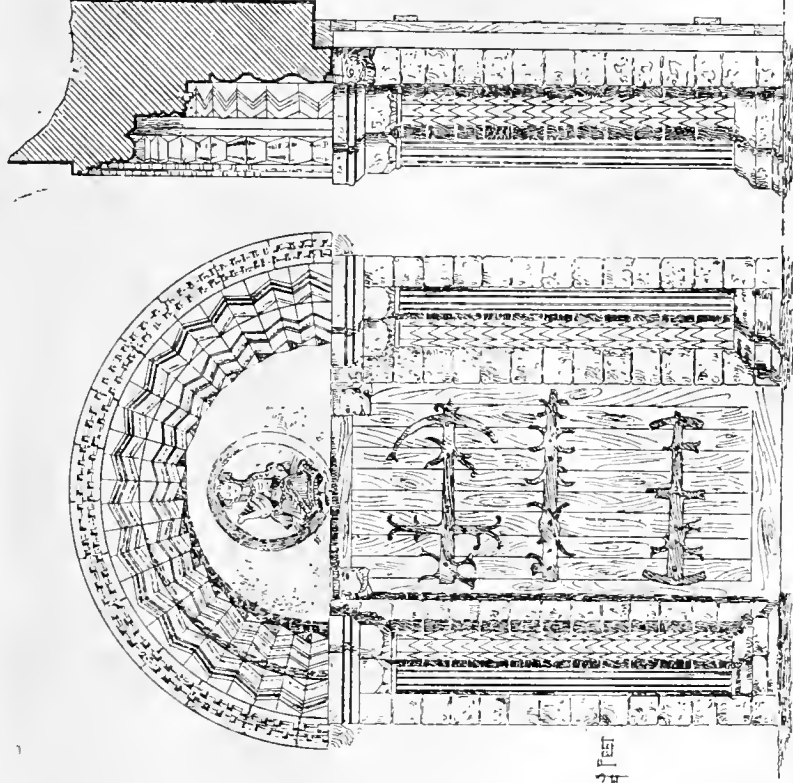
SCALE FOR DETAILS



SCALE FOR PLANS ELEVATION AND SECTION



Half-Plan.

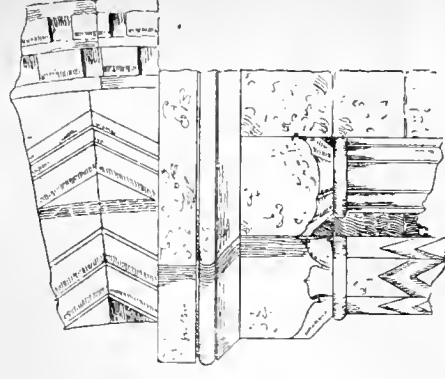


Elevation.

Section.



Section of Head.



Detail of Capital.

WATER SUPPLY AND SANITARY MATTERS.

ST. HELEN'S WATER SUPPLY.—The new pumping station at Melling, near Ormskirk, which has been provided by the St. Helen's Corporation as an additional source of water supply, was formally opened by the mayor of St. Helen's on Oct. 1. The new pumping station includes two boreholes, each 24in. diam. and 560ft. deep, with horizontal compound engine, designed by Mr. J. J. Lackland, the borough water engineer, and constructed by Messrs. Robinson, Cooks, and Co., of St. Helens. The contract for the boreholes was let to Messrs. Timmins and Son, of Runcorn, and for the work generally Messrs. Hughes and Stirling, of Bootle, were the contractors. From the Melling station an 18in. main runs to the Knowsley station, where it joins a 24in. main to Brown Edge, Thatto Heath, where the corporation water-softening works and reservoir are situated. The distance from Melling to Brown Edge is close upon ten miles. The water-softening works are capable of dealing with 2½ million gallons daily, and the softened water flows therefrom into a covered reservoir holding 2 million gallons; but a much larger storage reservoir, with a holding capacity of 10 million gallons, is now in course of construction on adjoining land.

TORQUAY WATER SUPPLY.—The Mayor of Torquay and the members of the Corporation journeyed to Trenchford on Thursday in last week to inaugurate important works of construction, in connection with the town's moorland water supply. The scheme of extension upon which the Council now enters consists of the construction of a new reservoir at Trenchford, sanction for which was obtained only a few months ago. The reservoir will have a capacity of about 200,000,000 gallons, and cover an area of thirty acres. The greatest depth of water it will contain will be 50ft., while from the foundations to the top of the embankment there will be a depth of 80ft. The present roads running up the valley will be submerged and diverted. The width of the embankment at the summit will be 20ft., and at the base 300ft. The dam will be made with a concrete core below the surface of the ground, and above with a clay core backed with earth. The cost of the work is estimated at £22,000, and the reservoir will be constructed by the corporation itself, under the direct supervision of the water engineer, Mr. S. C. Chapman.

FLUSH TANKS FOR SEWAGE.—The session of the Civil and Mechanical Engineers' Society was opened by an address, on Friday night, in Caxton Hall, Westminster, when the president, Mr. A. Hanssen, chose as his topic "Flush Tanks." He considered that the great epidemics of cholera in the middle of last century were really blessings in disguise, because they called attention to the fact that one of the principal causes of epidemics was the pollution of the subsoil, and that all organic impurities and all waste products utilised as manure was got rid of as cheaply as possible. After references to the construction of sewers, and what they had been in the past, he attributed to the sanitary authorities of Westminster and Marylebone the knowledge which they now possessed of what sanitary sewers should be—namely, that they should be watertight, and laid at such a gradient that the sewage would flow through them with the velocity of about 2·50ft. per second. There were three classes of tanks:—(1) Those fitted with mechanical motions, such as deep basins, used either alone for the whole flush, or together with a siphon for separating the action of the same; (2) tanks with vacuum siphons where the tank was discharged by producing a slight vacuum in the descending leg of the siphon by means of a thin stream of water overflowing from the tank and falling through it. The water seat at the foot of the descending leg of the siphon in that case was seldom more than about an inch in diameter. (3) Tanks with plenum siphons, where the outlet pipe was provided with a deep water-seal, sometimes as much as 36in. deep, and the tank was filled with water to a corresponding height above the top of the siphon; the discharge took place when the air inclosed and compressed in the siphon by the action of the water in the tank was allowed to escape, either by means of a vent pipe or by forcing the water seal. All three types were in the market, and used in different parts of the country.

SKEGNESS.—On Friday Col. A. G. Darnford, R.E., Local Government inspector, conducted an inquiry at Skegness concerning the urban council's application to borrow £10,360 for new sewerage works. The scheme was explained by Mr. J. R. Elliott, A.M.I.C.E., representing the engineers, Messrs. Elliott and Brown, of Nottingham, and consists of new bacterial purification works, additional pumping station, and improvements and extensions to the sewerage, rendered necessary by the rapid growth of the district. There was no opposition.

A boys' clubhouse in St. Werburgh's, Bristol, was formally opened on Saturday. The architects were Messrs. Paul and James, and the builders Messrs. Bennett, of Pennywell-road, Bristol.

STATUES, MEMORIALS, &c.

CADELEIGH, DEVON.—In St. Bartholomew's Church, Cadeleigh, has just been restored a very fine specimen of Jacobean sculpture. Under a richly-wrought canopy are two recumbent effigies of Sir Symon and Lady Leach (of 1700) and kneeling figures of their nine children. The inscription is as follows:—"Here lye the bodies of S. Symon Leach, Knight, son of Symon Leach, of Crediton, and of Lady Catherin Leach, his wife, daughter of Nicholas Tuberville, of Crediton, Esq., whose true affection in religious wedlock caused their desire to make their bed together in the dust." In March, 1901, Mr. Prescott Row, secretary of the Homeland Association, heard by accident that the monument, which was tottering to its fall, was about to be removed from the church. He wrote to the daily Press suggesting that it would be an act of vandalism for so remarkable an example of Jacobean work to be destroyed. The appeal met with a response; but it was not till last week that the restoration was completed. While the work was in progress two sculptured figures, supposed to represent St. Bartholomew, were discovered in the walls of the tower.

CHIPS.

Sir Henry Thompson formally inaugurated on Wednesday a new crematorium which has been constructed at Perry Barr, on the outskirts of Birmingham. Messrs. Bateman and Bateman, of Birmingham, are the architects.

The Earl of Northbrook opened on Wednesday at Christchurch, Hants, the new Technical Schools, built as a memorial to Queen Victoria.

The portrait of Sir John McDougall, who was Chairman of the London County Council during 1902-3, will be presented at the County Hall, Spring Gardens, on Tuesday next, at half-past two, by his colleagues, members of the Council. The portrait is by Mr. J. Spencer Watson.

The Epping Forest Committee of the Corporation will proceed to-morrow (Saturday) to the Forest. Among the works to be inspected are a proposed widening of a roadway at Hile End, the widening of Chingford-road, and the progress of the operations at Hollow Pond.

The unveiling of the Kensit Memorial at Hampstead Cemetery, which has been erected by the London Council of United Protestant Societies, will take place to-morrow, Saturday, at 3 p.m. The memorial is in the form of a plain obelisk, cut from Peterhead granite, and stands about 16ft. high.

The Board of Trade have recently confirmed the following Light Railway Order made by the Light Railway Commissioners—viz., the Llandudno and Colwyn Bay Light Railway (Deviation and Amendment) Order, 1903, amending the Llandudno and Colwyn Bay Light Railway Order, 1893.

The City Corporation has agreed to plans for the building of a crematorium at the City of London Cemetery at Ilford, at a cost of £7,000. The foundation-stone will be laid by Mr. R. W. Edwards, chairman of the Sanitary Committee, on Wednesday next.

The recently-opened Pankhurst Hall in St. James'-road, Hightown, was on Monday the scene of an interesting gathering. Some mural decorations have been done by Miss Pankhurst, and their completion was made the occasion of an address by Mr. Walter Crane. Emblems of the future and of the ideal have been chosen in working out the scheme of decoration. The entrance-hall is adorned with adaptations of the peacock's feather, the lily, and the rose; and the name of the hall is given in decorative lettering. Roses and clove-apple trees for knowledge and doves for peace are the symbolic features in the large hall.

The urban district council of Oakengates have instructed Mr. R. E. W. Barrington, M.Inst.C.E., to proceed with the carrying out of a new sewerage scheme, and have accepted the tender of Mr. H. Holloway, Wolverhampton, at £7,897.

The tramway system at Gateshead has just been extended from Sheriff Hill to Wrekenton, a distance of 1½ mile. Mr. H. Howley has acted as managing engineer, and Mr. Thompson as resident engineer. The Board of Trade inspection prior to opening was held by Colonel Von Donop on Friday. The permanent way contract was performed by Mr. J. J. Robson, the overhead work being done by the company under the superintendence of Mr. P. Shannon. The extension has cost nearly £10,000.

California redwood has been found useful in the construction of the big pipes used for the conveyance of water to many of the electric power houses in the northern part of the State. These pipes are built up and banded. They cost less than metal pipes, and are more durable. Redwood outlives all other woods when kept constantly moist. Moreover, it burns much more slowly than any other kind of timber used for building purposes, as it contains no inflammable oil or resin.

A Local Government Board inquiry was held at Hastings last week into the application of the town council for permission to borrow £2,059 for sewerage works, £250 for electric lighting, and £138 for street improvements.

The directors of the Manchester, South Junction, and Altrincham Railway Co. have under consideration the electrification of their line, which connects Manchester with Bowdon. Plans and specifications are being prepared, and on the acceptance of the estimates the work will be proceeded with without delay.

The Bishop of Worcester, on Saturday, dedicated the new church of the Ascension at Newtown, Malvern, erected by Mrs. Livingstone to the memory of her husband. The style is Early English. The nave and choir will accommodate a congregation of about 400. The tower contains a baptistry, organ chamber, and belfry, in its three successive stages. Externally, on the western side, is a sculptural representation of the Ascension. The instructions of the donor to the architect were that the very best of materials should be used throughout.

Mr. Henry Patteson, of Middleton Lodge, Kantsford, and of J. and H. Patteson, 36, Oxford-street, Manchester, marble merchants, who died on August 20 last, aged 32 years, left estate valued at £13,238 gross and at £12,493 net.

At the last meeting of the city council of Hull it was decided to proceed forthwith with the town-hall, a proposal to adjourn consideration of the question for twelve months being defeated by 23 to 26 votes.

The bust of the late Right Hon. Cecil Rhodes, executed for the City Corporation by Mr. H. A. Pegram, was unveiled at the last meeting of the Court of Common Council. It will be placed permanently in the Lobby of the Guildhall.

The work in connection with the erection of a new bridge across the river Tay at Kinclaven has been in progress for some weeks past. The bridge will consist of six concrete arches, with stone facings and parapets, and concrete coping, and will have a roadway 16ft. wide. The plans are by Mr. Harrison, C.E., and advice in their preparation was given by Sir John Wolfe Barry. The contractors are Messrs. Young, Limited, Glasgow. The bridge is estimated to cost about £3,000, of which sum the Perth County Council have subscribed £2,600.

On Saturday at St. George's, Edgbaston, the vicar dedicated a new stained-glass window to the memory of the late Mr. and Mrs. J. D. Goodman. The window has been erected at the east end of the north aisle, and is the work of Mr. C. E. Kempe, of London. The design is "The Tree of Jesse"—or a representation of the genealogy of our Lord as recorded in the 1st chapter of St. Matthew, showing the fulfilment of the prophecy of His birth, of the house and lineage of David.

Another section of the restoration of the Great Priory Church of Wymondham, Norfolk, was reached during last week, when the long-silent peal of bells in the 15th century western tower was reopened. Three new bells have been provided, and one which was cracked has been recast, the peal now consisting of an octave. The casting has been carried out by Messrs. Mears and Sainbank, of Whitechapel, and the rehanging was executed by Messrs. Day, of Eye, Suffolk.

Mr. Andrew Carnegie has promised to bear the cost, which is estimated at £15,750, of a library to be erected at West Derby, Liverpool.

At the last meeting of the Drapers' Chamber of Trade the secretary reported that he had received two letters from the clerk of the London County Council asking if the Chamber had any suggestions to make with respect to the proposed general amendment of the London Building Acts. The meeting referred the letters to the Parliamentary committee.

Mr. W. A. Dacat, Local Government Board inspector, held an inquiry at Wallend on Friday regarding an application of the corporation for sanction to borrow £24,177 ls. 10d. for the purposes of the main road and private street improvements.

During the year 1902, 566 miles were added to the railway system of India, bringing the total mileage open at the close of the year up to 25,931. The addition between January 1 and April 30, 1903, of 630 miles increased the total on May 1, 1903, to 26,561 miles, of which 14,346 miles were on the 5ft. 6in. gauge, 11,247 on the metre or 3ft. 3½in. gauge, and 968 miles on the narrower gauges.

The inaugural meeting of the Surveyors' Institution for the session 1903-4 will be held on Monday evening, November 9, at 8 p.m., when the President Mr. Albert Bucknill, delivered an opening address.

The town council of Macclesfield have adopted the scheme of Mr. R. E. W. Barrington, M.Inst.C.E., of Westminster and Wolverhampton, for the improvement of their sewage disposal works at a cost of about £14,000.

Our Office Table.

PROFESSOR BERESFORD PITE, F.R.I.B.A., delivered at the Leicester Municipal School Art, on the 25th ult., the first of a course of lectures on architecture. He urged on students the importance of endeavouring to think out their problems for themselves, and to dismiss from their minds all prejudices as to style. He proceeded to treat the development of architecture, or rather of "building art," rapidly sketching the process of evolution, as exemplified in the work of the Egyptians, the Greeks, and the Romans. In conclusion he pointed out that English ideas in architecture were crystallised through the influence of Italian priests and bishops, and through the impressions brought home by pilgrims to the East. In conclusion he pointed out that there was without doubt a canon of proportion, adherence to which produced results that were satisfactory, and whatever views students might hold as to proportion in design they would find that they could not vary with safety the proportions laid down ages since by Vitruvius.

THE Metropolitan Water Board, at a meeting on Friday, considered the report of the special arbitration committee, which recommended that, if possible, an agreement should be come to with the Tottenham and Enfield Urban District Councils and other minor urban authorities so as to save much of the expense that would be incurred if the claims and liabilities of these bodies had to be settled by arbitration. The report also recommended approval of an estimate of £14,000, further expenditure likely to be incurred in connection with the arbitration proceedings. The report was received and its recommendations were approved.

THE Asylums Committee of the London County Council, in their fourteenth annual report for the year ended March 31, 1903, state that they have once more to chronicle a large increase in the number of certified lunatics. The disaster at Colney Hatch Asylum, when 51 inmates lost their lives, is thus referred to:—"The fire at Colney Hatch Asylum on January 27, 1903, deprived us of accommodation for 300 female patients. The total destruction of the annexe demonstrated the danger attaching to temporary structures of this nature. We have only one other structure built of entirely similar materials—viz., the annexe at Banstead Asylum (the Manor Asylum and the Haswell annexe being plaster lined). With the approval of the Commissioners in Lunacy and the Home Secretary we have made alterations in the connecting corridors and otherwise at these buildings which, we hope and believe, will reduce to a minimum any danger in case of fire. We desire here to record our appreciation of the kindness of the Metropolitan Asylums Board in spontaneously placing 198 beds, mostly at their newly-opened asylum at Tooting Bec, at our disposal immediately after the Colney Hatch fire."

THE deputation from Germany, representing the Central Benevolent Institution for Workmen in that country, visited Liverpool on Friday and Saturday for the purpose of gathering information regarding the housing of the working classes in the city and neighbourhood. They were taken charge of by the housing committee of the corporation, whose officials made arrangements for them to inspect several institutions of interest, as well as to see what the corporation have accomplished in the way of providing accommodation for people who have been dispossessed from insanitary dwellings. On Friday they visited Messrs. Lever Brothers' model village of Port Sunlight, and viewed houses provided by the firm's employees and also the many and varied forms of recreation placed at their disposal. A tour of the soapworks was further included in the programme, the deputation being subsequently entertained to luncheon. Subsequently the deputation proceeded to the Home for Aged Mariners, situated on the Cheshire shore of the Mersey at Egremont, and on returning to Liverpool paid visits of inspection to the corporation washhouses at Burroughs-gardens, where they were received by Mr. W. R. Court, the corporation's engineer and chief superintendent of baths, and to the Bevington House Hotel, an institution conducted on the lines of the Rowton Houses in London. Saturday was devoted to visiting the artisans' dwellings erected by the corporation in several districts, known locally as the demolition areas. A visit was also paid to the sterilised milk depot conducted under the management of the corporation.

The deputation were afterwards entertained to luncheon by the Housing Committee, and later in the afternoon they left for Glasgow.

AT Morley Memorial College, Waterloo-road, S.E., a series of eight lectures on the development of English Gothic architecture, illustrated by lantern views, plans, and diagrams, is being given on Monday evenings in connection with the Archeological Society. The introductory address was delivered on Monday evening by Mr. E. W. Harvey Piper, who took as his subject "Norwich Cathedral," with special reference to the discoveries made during the recent works of reparation. Mr. F. W. Reader occupied the chair. The second lecture will be given by Mr. C. H. Dedman on Monday week, the 19th inst., his topic being "The West Fronts of Our Cathedrals," and these will be followed by a half a dozen addresses by Mr. Ernest Godman, architect, the secretary to the Survey Committee of London, who will trace the growth of English architecture from the 11th to the 16th centuries. Saturday afternoon visits are to be paid by the members, under the conduct of Mr. Godman, to the churches of St. Bartholomew the Great, Smithfield; St. Saviour, Southwark; St. Etheldreda, Ely-place; and All Hallows, Barking.

ARE contractors justified in employing female labour on engineering operations? Considerable discussion took place on Monday at a meeting of Dundee Harbour Board over the employment of women at the works in connection with the reconstruction of the eastern wharf. A sub-committee reported that, in view of the conditions of the labour and the opinion of the legal adviser of the Board that there was no clause in the specifications to prevent the contractors, Messrs. Best and Co., Leith, from employing any kind of labour they chose, they saw no cause to interfere. Billie Melville moved the disapproval of the report, on the ground that the contract did explicitly state that men were to be employed, and also because he held the work was entirely men's work. He was certain that the only consideration which entered into the minds of the contractors for the employment of women instead of men at a particular section of the work was that they could get women at considerably less wages than they would have to pay to men. The difference between the wages of the women and what would have had to be paid had men been employed simply went to make up extra profit to the contractors. Billie Robertson, in seconding the disapproval of the report, said he was sure the engineer had never contemplated the employment of women on the works. Mr. Andrew Leitch supported the committee's recommendation, remarking that the kind of labour at which the women were engaged was far more suitable for them than most of the employment in their mills and factories. They were powerless, by the terms of the contract, to interfere, and they must just see that in future no female labour could be employed. Sir James Low remarked that any citizen going down and watching what kind of work the women had to do must admit that the work was entirely within their scope. The work was not for men, but boys; but, unfortunately, in Dundee, it was exceedingly difficult to get boys to be steady at work. He fancied the reason the contractors had preferred women was because they were much steadier in their habits than the boys one sometimes got in Dundee. By 17 votes to 5 the report of the committee was approved.

MR. RICHARD BELL, M.P., presided at the first ordinary general meeting of the North Wales Quarries, Ltd., held at the Co-operative Hall, Derby, on Saturday afternoon. The directors, in their report, stated that the society took over the Pantdrcinirg quarries on Aug. 1, and at that time there were 108 men employed there. These were engaged for the purpose of assisting the men who were out of work. At the present moment there were 195 men employed there, and it was hoped to employ more immediately. There had been some little delay in negotiating the purchase of the Moel Faban Quarry, but it would be shortly completed. The third property, the Tan-y-bwlch quarry, near Bethesda, had passed into their hands that day on considerably better terms than were expected. The share capital up to the present was a little over £19,000, and the number of shareholders 687. From the day when the society took possession of the quarry the receipts from the sale of slates amounted to £1,271 18s., but that did not include the rents of the cottages. The expenses for the same period

were £1,192 2s. 6d., leaving the net profits for the two months £79 15s. 6d. The profits would have been larger but for the fact that the quarries had been flooded ten days. The report was adopted, and the directors and auditors re-elected, whilst Mr. J. Wilson, M.P., and Mr. Guinness were appointed to represent the shareholders on the Board of Conciliation that is to be formed to consider disputes between the society and the workmen.

ACCORDING to a report submitted to the county council of Perthshire by the road surveyor, the roads in the western district of that county are deplorably narrow. The reference arose from the requirements of the recently-passed Motor Car Act, and the road surveyor stated that the total mileage of roads in the western district was 267, and the average width 13ft. The length of roads on which motor-cars might travel at a rate not exceeding twenty miles was 55, their width being 17ft. The length of roads on which the speed would require to be restricted was 99 miles, and the average width 12ft. The length of roads that would be closed to motor-cars was 112 miles, with an average width of 10ft. It was agreed to defer consideration of the report until a special meeting, the road maintenance committee, in the meantime, to obtain full information on the subject.

THE cathedral at Meissen, in Saxony, has just escaped from a grave danger, no less than that of being restored according to the latest canons of Teutonic architecture. At a Congress held in Erfurt lately, dealing with the preservation of national monuments, the scheme was broached, and but for what appears an actual intervention of Providence would have been agreed to there and then. Professor Cornelius Gurlitt, of Dresden, in the course of a speech declared that while in Germany they believed that they had elevated the science of "restoration" to incomparable heights, there were those in other countries, among them "the Union of British Architects"—a body by the way, not easily identified under that misnomer—who maintained precisely opposite views. He proposed heroic measures to decide the question for ever—no less than the restoration of Meissen Cathedral, a 15th-century marvel, which he had personally closely studied. Unfortunately, in the course of his remarks Professor Gurlitt fell foul of another authority, Herr Oberbaurath Schaefer, of Karlsruhe, whom he accused of negligence, presumption, and a dismal tendency towards "embellishing" according to his own ideas whatever was intrusted to him. The outraged architect defended himself vigorously, carrying the war into the enemy's country by the assertion that he was well aware of Professor Gurlitt's envious hatred, and that he had received from a news agency 1,400 newspaper articles attacking him, all of which, as he knew by their style, had been written by the professor himself. Great uproar arose, the assembly took sides with one or the other, and the cathedral of Meissen was forgotten.

THE famous Eiffel Tower is to disappear. The municipal committee of "Old Paris" has decreed that the huge structure shall be pulled down at the expiration, in 1910, of the concession held by the Eiffel Tower Company. Various schemes are now on foot for removing the edifice to some other place. It has even been proposed that it shall be acquired by the State, and set up somewhere on the French coast to act as a sort of gigantic lighthouse. The alternative is to sell the tower to some foreign capitalist.

A VERY useful new illustrated pamphlet, showing various applications of Uralite, has been issued by the British Uralite Co., Ltd., 50, Cannon-street, London, E.C. The uses of this material are certainly co-extensive with almost every branch of construction and manufacture. For roofing it is unequalled. For fire-resisting doors, in the rapid erection of buildings quickly wanted, it has few rivals. For insulation purposes it offers extraordinary advantages. In breweries, malt kilns, and similar structures it prevents condensation, and is acid proof; and in hospital construction it secures cheap and certain guarantees against infection.

AT a meeting held recently in the City Chambers of Glasgow, Bailie Bilsland and Mr. James Paton, F.L.S., convener and superintendent of the local museums and art galleries, met several representatives from the University and the large shipbuilding and engineering firms, to discuss with them the best means of promoting the forthcoming Naval and Engineering Exhibi-

tion at the People's Palace, Glasgow. Owing to restricted space, it was unanimously agreed to make a special effort to have the exhibition as much as possible an amateurs' and workmen's show, without calling upon large firms for exhibits, unless absolutely necessary to do so. Fifty pounds will be awarded, besides certificates of merit, for models in the competition section.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—Architectural Association School of Design. Preliminary Meeting. Addresses by Walter Cave and J. S. Gibson. 9, Conduit-street. 7 p.m.

WEDNESDAY.—Architectural Association Camera Club. "Little Known Irish Abbots," by C. H. Oakden, F.R.P.S., 59, Great Marlborough-street, W. 7.30 p.m.

THURSDAY.—Shetheld Society of Architects and Surveyors. Presidential Address by T. Winder, A.M.I.C.E.

FRIDAY.—Architectural Association. "The Day School in Relation to Architectural Pupilage," by A. T. Bolton and H. P. G. Maule, 9, Conduit-street. 7.30 p.m.

THE ARCHITECTURAL ASSOCIATION.

OCTOBER 13th. PRELIMINARY MEETING OF THE SCHOOL OF DESIGN at No. 9, Conduit-street, W., at 7 p.m., when ADVERTISEMENTS to the Students will be delivered by Messrs. WALTER CAVE and J. S. GIBSON. Any member may attend without payment of the School of Design fee.

OCTOBER 14th. ORDINARY GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. PAPERS by Messrs. ARTHUR T. BOLTON and H. P. G. MAULE on "The Day School in Relation to Architectural Pupilage." Exhibition of Drawings by Day School Students.

LOUIS AMBLER } Hon. Secs.
H. TANNER, Jun }
H. TANNER, Jun }

CHIPS.

A site of about an acre in extent has been secured, at a cost of £3,000, in Tyndall's Park, Bristol, for the new Baptist College for the West of England. The present building at Stokes Croft is said to have been erected from plans originally designed for Dartmoor Prison.

Colonel Von Donop made an inspection on Friday of the new tramways recently laid down by the Newcastle-on-Tyne Corporation at Benwell, from the toll-gate to Condercum-road, on the Elswick-road and Westgate routes; also from the Byker car-depot to the Wallend terminus; and also the extension from the Stack Hotel to a point near the railway station at Low Walker.

The Leeds Corporation is seeking powers to borrow £220,000 for electric lighting purposes.

The inauguration of the Bexley Urban District Council's electric lighting and tramway schemes took place on Thursday. About £100,000 has been expended on the scheme. There are 5½ miles of tramways. They extend from the terminus of the Woolwich and South-East London tramway at Plumstead, and traverse the Old Dover-road, through Bexley Heath to the Dartford Rural Council's boundary, and branch off to the left to the boundary of Erith parish, thus supplying connections for future tramways in these two directions.

The new city museum at Winchester will be opened by the Mayor on Thursday next the 15th inst. It is situated in the Square, and has been built by Messrs. Coston from plans by Messrs. Missett and Farrow, all of Winchester.

Bishop Taylor-Smith, Chaplain-General to the Forces, dedicated on Sunday a marble pavement, a reredos, and Holy Table in Christ Church, Royal Military College, Sandhurst, to the memory of former cadets of the college who fell in South Africa. The reredos and Holy Table are of oak. On the reredos are carved the figures of Christ and St. George, St. Michael, Gideon, and Joshua. The pavement is mosaic marble. Besides these memorials are eight small tablets and three large ones bearing the names of 272 former cadets of the college who fell in South Africa. Among them is the name of Lord Roberts's son.

Mr. F. Tulloch held a Local Government Board inquiry at Harrogate on Friday, relative to the application of the town council to borrow £1,450 for the purchase of land at Stonefall for a cemetery; and also respecting the application to borrow £1,750 for the purchase by the Corporation of the Harrogate Swimming Baths, previously owned by a private company.

Ripon City Council has decided to borrow £5,300 for the erection of baths in connection with the Sap scheme.

A new altar, dedicated to the Sacred Heart, was formally unveiled on Sunday at St. Alban's Roman Catholic Church, Blackburn. The altar, besides the lower part of the reredos, is composed of Sicilian white marble, relieved with rouge marble, and comes from the studio of Mr. E. J. Pappet, of Birmingham. The altar cost £400.

Trade News.

WAGES MOVEMENTS.

TRADE PROSPECTS IN WESTERN AUSTRALIA AND NEW ZEALAND.—The October circular of the Emigrants' Information Office states that returns from the various districts of Western Australia for the quarter ending June 30 last show that the only demands for labour then were as follows:—For mechanics in the building and other trades at Northam, for men in the building trades only at Guildford and Bunbury, and for carpenters on the Murchison goldfields. The last reports from New Zealand show that nearly every trade was well employed. There is a good opening for competent carpenters, bricklayers, painters, plumbers, saw-millers, plasterers, sash and door makers, turners, and gasfitters.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0	to £5 15 0
Rolled-Steel Joists, English.....	6 10 0	to 6 12 6
Wrought-Iron Girder Plates.....	7 0 0	to 7 5 0
Bar Iron, good Staffs.....	6 5 0	to 8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0	to 20 0 0
Do., Welsh.....	5 15 0	to 5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0	to 8 15 0
Best Suedsbill.....	9 10 0	to 9 10 0
Angles 10s., Teea 20s. per ton extra.		

Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.
Builders' Hoop Iron, galvanised, £12 to £13 per ton.
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£11 15 0	to £12 0 0
Best ditto.....	12 5 0	to 12 10 0
Cast-Iron Columns.....	£6 10 0	to £8 10 0
Cast-Iron Stanchions.....	6 10 0	to 8 10 0
Rolled-Iron Fencing Wire.....	8 0 0	to 8 5 0
Rolled-Steel Fencing Wire.....	6 5 0	to 6 10 0
Galvanised.....	7 15 0	to 8 0 0
Cast-Iron Sash Weights.....	4 12 8	to 4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0	to 9 5 0
Cut Floor Brads.....	9 0 0	to 9 0 0

Wire Nails (Points de Paris)—
6 to 7 8 9 10 11 12 13 14 15 B.W.G.
8/- 8 6 9/- 9 6 9 10 6 11 3 12/- 13/- per cwt.
Cast-Iron Socket Pipes—
3in. diameter..... £5 15 0 to £8 0 0
4in. to 6in..... 5 12 8 to 5 17 6
7in. to 24in. (all sizes)..... 5 7 6 to 5 10 0
[Coated with composition, 3s. 6d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—
Cold Blast, Lillishall..... 105s. 0d. to 112s. 6d.
Hot Blast, ditto..... 65s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

	10cwt. casks.	5cwt. casks.
Gas-Tubes.....	£23 0 0	to £24 10 0
Water-Tubes.....	26 5 0	to 26 15 0
Steam-Tubes.....	13 15 0	to 13 15 0
Galvanised Gas-Tubes.....	11 5 0	to 14 5 0
Galvanised Water-Tubes.....	15 2 6	to 15 2 6
Galvanised Steam-Tubes.....	16 2 6	to 16 2 6

	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0	to £24 10 0
Do., Vieille Montagne.....	26 5 0	to 26 15 0
Sheet Lead, 3lb. and upwards.....	13 15 0	to 13 15 0
Lead Water Pipe (F.O.R. Lond.).....	11 5 0	to 14 5 0
Lead Barrel Pipe.....	15 2 6	to 15 2 6
Lead Pipe, Tinned inside.....	16 2 6	to 16 2 6
and outside.....	17 12 6	to 17 12 6
Composition Gas-Pipe.....	16 2 6	to 16 2 6
Soil-Pipe (3in. and 6in. extra).....	16 2 6	to 16 2 6
Pig Lead, in 1cwt. pigs.....	10 16 3	to 10 17 6
Lead Shot, in 28lb. bags.....	15 0 0	to 15 5 0
Copper Sheets, sheathing and rods.....	71 0 0	to 71 5 0
Copper, British Cake and Ingots.....	58 10 0	to 59 10 0
Tin, Straits.....	115 5 0	to 115 15 0
Do., English Ingots.....	116 15 0	to 117 0 0
Spelter, Silesian.....	20 15 0	to 21 5 0

TIMBER.

	per load	£10 0 0	to £18 0 0
Teak, Burmah.....	9 15 0	to 16 0 0	
Do., Bangkok.....	3 12 6	to 6 5 0	
Quebec Pine, yellow.....	4 12 6	to 7 10 0	
Do., Oak.....	5 0 0	to 10 0 0	
Do., Birch.....	4 7 6	to 9 0 0	
Do., Elm.....	4 12 6	to 8 5 0	
Do., Ash.....	2 12 6	to 6 10 0	
Danish and Memel Oak.....	3 2 6	to 5 10 0	
Do., Fir.....	2 7 6	to 5 5 0	
Wainscot, Riga p. log.....	4 0 0	to 6 0 0	
Lath, Danish, p.f.....	4 0 0	to 6 0 0	
St. Petersburg.....	7 15 0	to 8 0 0	
Greenheart.....	7 0 0	to 15 0 0	
Box.....	0 3 6	to 0 3 9	
Sequoia, U.S.A., per cube foot.....	0 0 8	to 0 0 8	
Mahogany, Cuba, per super foot.....	0 0 6	to 0 0 6	
Do., Honduras.....	0 0 4	to 0 0 5	
Do., African.....	0 0 3 1/2	to 0 0 5 1/2	
Cedar, Cuba.....	0 0 3	to 0 0 3 1/2	
Do., Honduras.....	0 0 3 1/2	to 0 0 3 1/2	
Satinwood.....	0 0 10	to 0 1 9	
Walnut, Italian.....	0 0 3	to 0 0 7 1/2	
Do., American (logs).....	0 3 1	to 0 3 1	

Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2 in. by 1 1/2 in. :—

Quebec, Pine, 1st.....	£22 0 0	to £29 5 0
Do., 2nd.....	18 5 0	to 23 10 0
Do., 3rd.....	11 15 0	to 14 0 0
Canada Spruce, 1st.....	11 10 0	to 15 5 0
Do., 2nd and 3rd.....	8 10 0	to 10 0 0
New Brunswick.....	8 0 0	to 9 10 0
Riga.....	7 10 0	to 8 5 0
St. Petersburg.....	8 10 0	to 16 10 0
Swedish.....	11 10 0	to 19 10 0
Finland.....	9 0 0	to 10 5 0
White Sea.....	12 0 0	to 19 10 0
Battens, all sorts.....	6 10 0	to 14 0 0

Flooring Boards, per square of 1 1/2 in. :—
1st prepared..... £0 13 6 to £0 19 0
2nd ditto..... 0 12 0 to 0 16 0
Other qualities..... 0 6 0 to 0 14 0

Staves, per standard M :—
U.S., pipe..... £37 10 0 to £45 0 0
Memel, cr. pipe..... 220 0 0 to 230 0 0
Memel, brack..... 190 0 0 to 200 0 0

STONE.

Darley Dale, in blocks..... per foot cube £0 2 8
Red Mansfield ditto..... " " 0 2 4
Hard York ditto..... " " 0 2 10
Ditto ditto 6in. sawn both sides, landings, random sizes..... per foot snp. 0 2 8
Ditto ditto 3in. slabs sawn two sides, random sizes..... " " £0 1 8
* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations..... per foot cube £0 1 0
Delivered on road waggons, Paddington Depot..... " " 0 1 6
Ditto ditto Nine Elms Depot..... " " 0 1 8

Portland Stone, in random blocks of 20ft. average :—
Brown..... £1 5 1/2 to £1 17 1/2
White..... " " 0 2 1 to 0 2 2
Whit Bed. Base Bed

Delivered to railway depot at the quarry..... per foot cube £0 1 5 1/2 to £0 1 7 1/2
Delivered on road waggons at Paddington Depot..... " " 0 2 1 to 0 2 2
Ditto Nine Elms Depot..... " " 0 2 1 to 0 2 2
Ditto Pimlico Wharf..... " " 0 2 1 to 0 2 2

FEYRE AND CO. s. d.
Blocks Palotte Banc Franc..... 1 5 per c ft. ex. steamer London

Ditto ditto Banc Royal..... 1 3 do. do. do.
Ditto Euville..... 1 9 do. do. do.
Ditto Comblanchieu..... 3 0 do. do. do.
Ditto Massangis (Roche)..... 2 6 do. do. do.

OILS.

Linseed..... per tun £18 0 0 to £18 10 0
Rapeseed, English pale..... " " 23 10 0 to 23 15 0
Do., brown..... " " 22 5 0 to 22 15 0
Cottonseed, refined..... " " 21 0 0 to 24 0 0
Olive, Spanish..... " " 32 0 0 to 32 0 0
Seal, pale..... " " 26 0 0 to 29 0 0
Cocoonut, Cochins..... " " 30 0 0 to 31 0 0
Do., Ceylon..... " " 25 0 0 to 26 0 0
Palm, Lagos..... " " 29 0 0 to 29 10 0
Oleins..... " " 17 5 0 to 19 5 0
Lubricating U.S..... per gal. 0 7 0 to 0 8 0
Petroleum, refined..... " " 0 0 5 1/2 to 0 0 6 1/2
Tar, Stockholm..... per barrel 1 6 0 to 1 6 0
Do., Archangel..... " " 6 19 8 to 1 0 0
Turpentine, American..... per tun 37 0 0 to 37 5 0

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immediate use.

Members of the Northern Architectural Association visited the new church of St. Chad, Bensha, Gateshead, on Saturday afternoon, and were shown over the edifice by the vicar, the Rev. H. Windley.

The corporation of Wednesbury have appointed Messrs. Dodd and Dodd, civil engineers, of Birmingham, as their engineers to design and carry out the conversion of their present precipitation system that of the biological.

LIST OF COMPETITIONS OPEN.

Rawtenstall—Free Library and Town Hall (Assessor)	£100, £50, £30	A. W. Lawson, A.M.I.C.E., Boro' Surveyor, Rawtenstall	Oct. 12
Bedlington—Corrugated Iron Fever Hospital .....	.....	C. Brown, Surveyor, Bedlington	17
Harrogate—Pump-Room and Colonnade in Valley Gardens .....	.....	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	26
Skewen—Public Library (limit £2,000)	£10 10s.	Samuel Jones, Clerk, Old-road, Skewen, Neath	Nov. 9
Kilmarnock—Tenement of Shops and Workmen's Houses	£15 15s., £10 10s., £5 5s.	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	9
Sunderland—Additions to Town Hall	£100, £200, £100, £250	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	24
Wakefield—Reconstructing Cattle Market	50gs. (merged), 25gs.	R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Glasgow—Branch Library for Parkhead District .....	.....	Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	—
Liverpool—Cotton Exchange (Local Architects) .....	.....	Peter Brown, Sec., 57, Brown's Buildings, Liverpool	—
Oldham—Board School .....	.....	J. Rennie, Clerk, School Board Offices, Oldham	—

LIST OF TENDERS OPEN.

BUILDINGS.

Downpatrick—Seven Labourers' Cottages	Rural District Council	Edward Nolan, C.E., Workhouse, Downpatrick	Oct. 19
North Shields—Altering White Hart Hotel	C. H. Sayce	J. P. Spencer, Architect, 30, Howard-street, North Shields	10
Abergavenny—Bakery	Newcastle Breweries, Ltd.	B. J. Francis, Architect, Abergavenny	10
Seaton Sluice—Melton Constable Hotel	E. Evans Bevan	S. Oswald and Son, Architects, 33, Mosley-st., Newcastle-on-Tyne ..	10
Pontefract—Free Library, Salter-row	Education Committee	Garside and Pennington, Architects, Pontefract	10
Seven Sisters, Mon.—Thirty Houses	Corporation	J. Cook Rees, Architect, Neath	10
Manchester—Alfred-street Municipal Schools	Smithfield Club	The Education Offices, Deansgate, Manchester	10
Shibden—House	Henry A. Burke	J. F. Walsh and G. Nicholas, Archts., Museum Chambers, Halifax ..	10
Barrow-in-Furness—Alterations to Old Municipal Buildings	Aberystroth School Board	The Borough Engineer's Office, Barrow-in-Furness	10
Leeds—Wood Annexes at Cattle Market	J. Bell	Fred Mitchell, Architect, 9, Upper Fountains-street, Leeds	10
West Hartlepool—Three Houses, Colwyn-road	Twyn Carno Building Club	Francis E. Boaz, York-road, West Hartlepool	10
Ballinamallard—Business Premises	Urban District Council	T. Elliott, Architect, 37, Darling-street, Enniskillen	10
Nantyglo—Classroom, &c.	Management Committee	R. L. Roberts, Architect, Abecarn	12
High Spen—House, Hugar-road	Highways Committee	Thos. H. Murray, Architect, Consett	12
Rhymney—Ninety-one Houses	Borough Council	T. Roderick, Architect, Glebeland, Merthyr Tydfil	12
Beckenham—Alteration to Sheds	Corporation	John A. Angell, Surveyor, Beckenham	12
Mullingar—Soldiers' Home	North-Eastern Railway Co.	A. E. Joyce, Architect, Mullingar	12
Eastbourne—Refuge Destructor Buildings	Parton and Harrington Breweries ..	Daniel J. Bowe, Borough Surveyor, Town Hall, Eastbourne	13
Bethnal Green, N.E.—Clearing Site of Electricity Works	Llaodilo-Talybont Parish Council ..	The Borough Surveyor, Town Hall, Bethnal Green, N.E.	13
Lettakenny—Floors at Lunatic Asylum	Wesleyan Methodist Trustees	J. P. McGrath, Architect, Foyle-street, Londonderry	13
Brede—Joinery Work at Engine-House	Electricity Committee	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings ..	13
Middlesbrough—Accumulator House & Clock Tower at Docks	Lambeth Guardians	William Bell, Architect, York	14
Whitehaven—Alterations to Shakespeare Hotel	North-Eastern Railway Co.	Wm. Carmichael, Architect, Parton, Whitehaven	14
Pontardulais—Parish Storehouse	Parton and Harrington Breweries ..	Thomas Thomas, Glasfryn House, Pontardulais	14
Lincoln—Operating Rooms at County Hospital	Greenwich Borough Council	W. Watkins and Son, Architects, Silver-street, Lincoln	14
York—Offices	H.M. Commissioners of Works	William Bell, Architect, York	14
Swindon—Five Shops and Sunday School	Improvement Committee	William F. Bird, Architect, Midsomer Norton, Somerset	14
Kilmarnock—Generating Station	Education Committee	R. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	14
London, S.W.—Repairs to Relief Station, Stockwell-road	Town Council	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	14
Seaham—Stationmaster's House	Thomas Leathe Exors	William Bell, Architect, York	14
Whitehaven—Alterations to Brow Top Beerhouse	Education Committee	Wm. Carmichael, Architect, Parton, Whitehaven	14
Blackheath, S.E.—Depot Buildings, St. John's Park	S. L. Jones	The Borough Engineer's Office, Town Hall, Greenwich-road, S.E.	15
Hereford—Extension of Post Office	Great Northern (Ireland) Ry. Co.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	16
Dublin—Canteen at Ordnance Survey Office, Phoenix Park	Metropolitan Railway Co.	The Office of Public Works, Dublin	16
Hull—Thirty-two Artisans' Dwellings, Sternburg-street	Great Northern (Ireland) Ry. Co.	Joseph H. Hirst, City Architect, Town Hall, Hull	16
Barrow-in-Furness—Store-Shed at Cambridge-street School	Great Northern (Ireland) Ry. Co.	C. F. Preston, Town Clerk, Barrow	17
Peebles—New Oastworks, Eschels	Bucks County Council	Wm. Buchan, Town Clerk, Peebles	17
Embleton—Buildings at Low Netherlands	Guardians	Edmund Jackson, Civil Engineer, Whitehaven	17
Barrow-in-Furness—Removal and Re-erection of Iron School	Industrial Co-operative Society	The Education Offices, Barrow	17
Resolven—Twenty Houses at Melincourt	Corporation	J. Cook Rees, Architect, Neath	17
Dewsbury—Warehouse, Bradford and Wood-streets	Tramways Committee	Holton and Fox, Architects, Corporation-street, Dewsbury	17
Hamiltonsbawn—Stationmaster's House	Education Committee	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin ..	19
Neasden, N.W.—Repairing Shed	Urban District Council	R. H. Selbie, Secretary, 32, Westbourne-terrace, W.	19
Malabide—Station Building	London County Council	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin ..	19
Acton—Engine-Shed at Old Oak Common	Standing Joint Committee	G. K. Mills, Secretary, Paddington Station, W.	19
Goragwood—Stationmaster's House	Tramways Committee	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin ..	19
Slough—Court-Room	London County Council	G. K. Mills, Secretary, Paddington Station, W.	19
Paddington, W.—Boiler-House at Harrow-road Workhouse	United Building Society	R. J. Thomas, M.I.C.E., County Surveyor, County Hall, Aylesbury ..	20
Ashington—Additions to Bakery Department	F. Eastaugh	F. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria-st., S.W.	21
Bristol—School, Air Balloon-hill, St. George	Corporation	John Magin, Secretary, Ashington	21
Hereford—Shedding at Cattle Market	Tramways Committee	La Trobe and Weston, Architects, 20, Clare-street, Bristol	22
Leicester—Two District Car-Sheds	Admiralty	J. Parker, City Surveyor, Mansion House, Hereford	22
St. Govan's Head—Coastguard Buildings	Education Committee	E. G. Mawbey, M.I.C.E., Engineer, Town Hall, Leicester	23
Portsmouth—School	Urban District Council	The Civil Engineer's Office, H.M. Dockyard, Pembroke Dock	23
Iford—Depot, &c., Ley-street	London County Council	Rake and Cogswell, Architects, Prudential Buildings, Landport ..	23
Nine Elms, N.W.—Lennox Buildings	Standing Joint Committee	H. Shaw, A.M.I.C.E., Surveyor, Town Hall, Iford	26
Portland—Additions to Police Station	Tramways Committee	The Architect's Dept., 19, Charing Cross-road, W.C.	27
Bury, Lancs.—Re-erecting Shop	London County Council	The County Surveyor's Office, Shire Hall, Dorchester	27
Hackney, N.E.—Vallette Buildings	Corporation	Arthur W. Bradley, Borough Engineer, Bank-street, Bury	27
Utley—Stable, &c.	Midland Railway Co.	The Architect's Dept., 19, Charing Cross-road, W.C.	27
Skircoat, Halifax—Two Villas	Corporation	Moore and Crabtree, Architects, York Chambers, Keighley	—
Pwll—Mission Church	Corporation	Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax ..	—
Tredegar—Ten Houses	Corporation	C. A. Jones, City Engineer, Llanelli	—
Pontypool—Presbyterian Hall	Corporation	H. S. Williams, Architect, Tredegar, Mon.	—
Leeds—Wesleyan Sunday-School, Cardigan-lane	Corporation	Habershon, Fawcner, and Co., Archts., High-st., Newport, Mon.	—
Southwold—Shop and Residence, High-street	Corporation	Danby and Simpson, Architects, 10, Park-row, Leeds	—
Dewsbury—Warehouse, Wood and Bradford-streets	Corporation	Arthur Polls, F.S.I., Architect, Beccles	—
Bridge of Allan—Ramsay's New Sanatorium	Corporation	Holton and Fox, Architects, Corporation-street, Dewsbury	—
Chelmsford—Shaft (80ft. high)	Corporation	Charles G. Soutar, Architect, 30, Whitehall-street, Dundee	—
Gateshead—Additions to Premises, West-street	Corporation	Ernest West, Contractor, Chelmsford	—
Stanningley—Workshop	Corporation	W. R. Story, Architect, 2, St. Nicholas Bldgs., Newcastle-on-Tyne ..	—
Harrogate—Additions to Claremont Hotel	Corporation	Percy Fox, Architect, 14, Manchester-road, Bradford	—
Newhaven—Post-Office	Corporation	Butler Wilson and Oglesby, Architects, 12, East Parade, Leeds	—
Cardigan—Rebuilding Premises	Corporation	F. J. Rayner, Architect, Fort-road, Newhaven, Sussex	—
Sheffield—Fifty Workmen's Cottages	Corporation	Captain Griffith Davies, 7, Castle-street, Cardigan	—
Harrogate—Additions to New Inn	Corporation	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	—
Bradford—House, &c., Canal-road	Corporation	H. E. and A. Bown, Architects, James-street, Harrogate	—
Newhaven—Altering Primitive Methodist Chapel	Corporation	Aird and Calder, Navigation Offices, Dock-street, Leeds	—
Knaresborough—Two Semi-Detached Houses	Corporation	F. J. Rayner, Architect, Fort-road, Newhaven, Sussex	—
		Wm. Driffield, Architect, Boroughbridge-road, Knaresborough	—

ELECTRICAL PLANT.

Aberdeen—Cable Subway	Town Council	W. Dyack, M.I.C.E., Burgh Surveyor, 41, Union-street, Aberdeen ..	Oct. 14
Swindon—Indicators, &c.	Corporation	J. G. Griffin, Engineer, Electricity Works, Swindon	14
Canterbury—Motor Fire-Engine	Urban Sanitary Authority	The Firemaster, Chief Fire Station, Lauriston-place, Edinburgh ..	14
Canterbury—Cable (2,200 yards of 'Isq.in.)	Town Council	The Engineer, Electricity Works, Canterbury	16
Harrismith—Electrical Machinery	Great Western Railway Co.	Morley and Dawbarn, 82, Victoria-street, Westminster, S.W.	19
London, W.—Telegraph Instruments and Apparatus	Tramways Committee	The Stores Superintendent, Swindon	19
Salford—Wiring Central Car Depot	Great Western Railway Co.	The General Manager, Tramway Offices, 32, Blackfriars-st., Salford ..	19
London, W.—Electric Lamps	Municipal Council	The Stores Superintendent, Swindon	19
Johannesburg—Plant	Metropolitan Railway Co.	Morley and Dawbarn, 82, Victoria-street, Westminster, S.W.	19
London, W.—Electric Lighting Sundries	Tramway Committee	R. H. Selbie, Secretary, 32, Westbourne-terrace, W.	19
Halifax—Dynamo	Tramway Committee	W. M. Robertson, Boro' Elec. Eng., Foundry-street, Halifax	21
Halifax—Cables, &c.	Corporation	W. M. Robertson, Boro' Elec. Eng., Foundry-street, Halifax	21
Swansea—Ducts, &c.	Corporation	C. A. L. Prusmann, Borough Electrical Engineer, Strand, Swansea ..	31
West Ham—Engine, Dynamo, &c., Abbey Mills Pumping Stn.	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Nov. 3
West Ham—Wiring Abbey Mills Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	3
Blackpool—Arc Lamp Carbons (One Year)	Corporation	Charles Furness, Boro' Elec. Eng., Electricity Works, Blackpool	—

ENGINEERING.

Withernsea—Gasholder	Holderness Gas Co.	J. Holliday, Engineer, Gas Office, St. Mark's-street, Hull	Oct. 10
Gravesend—Boiler at Church-street School	Education Committee	Charles E. Hutton, Town Clerk, Gravesend	" 10
Brentwood—Laying Half-Channel Pipes, &c.	Joint Committee	J. E. Fothergill, Surveyor, Town Hall, Brentwood	" 10
King's Norton—Electric Tramways (three miles)	Urban District Council	C. H. Gadsby, Engineer, 20, Victoria-street, Westminster, S.W.	" 10
Bedford—Waterworks	Corporation	Major H. Tulloch, C.B., R.E., 28, Victoria-st., Westminster, S.W.	" 12
Liverpool—Pipelaying (15½ miles)	Water Committee	The Water Engineer's Office, Municipal Buildings, Liverpool	" 12
Hamilton—Filters	Waterworks Commissioners	W. R. Copland, C.E., 146, West Regent-street, Glasgow	" 12
Brighouse—Heating Churches at Cemetery	Cemeteries Committee	S. S. Haywood, Borough Engineer, Brighouse	" 12
Margate—Waterworks	Corporation	Albert Latham, M.I.C.E., 15, Cecil-square, Margate	" 12
Pedham—Widening Padham Bridge	Lancashire County Council	The County Bridgemaister's Office, Preston	" 12
Letterkenny—Heating, &c., Lunatic Asylum	Isle of Wight R.D.C.	J. P. McGrath, Architect, Foyle-street, Londonderry	" 13
Whippingham and North Arretton—Waterworks	Main Sewerage Board	H. Eldridge Stratton, Clerk, Newport, I.W.	" 14
Richmond, Surrey—Sewer Entrance Shafts	Guardians	Wm. Fairley, Engineer, West Hall-road, Kew Gardens	" 14
Edinburgh—Steam Fire-Engine	Corporation	The Firemaster, Chief Fire Station, Lauriston-place, Edinburgh	" 14
Larne—Kitchen Appliances at Workhouse	Guardians	S. M. Wallace, Clerk, Union Office, Larne	" 14
Maryborough—Reservoir (100,000 gallons)	Dock Commissioners	J. V. Corcoran, Clerk, District Lunatic Asylum, Maryborough	" 14
Ipswich—Pilework to West-road Quay Wall, New Cut	Urban District Council	T. Miller, M.I.C.E., 9, Thoroughfare, Ipswich	" 15
Pontypridd—Viaduct and Bridge	Town Council	Reginald P. Wilson, Engineer, 66, Victoria-street, Westminster	" 16
Peebles—Gasholder	Education Committee	Wm. Buchan, Town Clerk, Peebles	" 17
Bristol—Heating and Ventilating Schools	Guardians	Holbrook and Oaten, Architects, 9, Clare-street, Bristol	" 19
Warwick—Weighbridge	Guardians	F. P. Trepass, F.I.A.S., 11, Church-street, Warwick	" 19
Salford—Machinery at Central Car Depot	Tramways Committee	The General Manager, 32, Blackfriars-street, Salford	" 19
Barnmouth—Telescopic Gas-Holder	Gas Co., Ltd.	W. Belton, Engineer, Gasworks, Shrewsbury	" 21
Halifax—Two Lancashire Boilers	Tramway Committee	W. M. Rogerson, Borough Electrical Engineer, Foundry-st., Halifax	" 21
Wolverhampton—Sinking Borehole	Corporation	E. A. B. Woodward, Waterworks Eng., Town Hall, Wolverhampton	" 26
Meerden—Reconstructing Bridge	Hertford County Council	Urban A. Smith, County Surveyor, Hatfield	" 26
Canterbury—Detritus and Septic Tanks	Drainage Committee	The City Engineer's Office, Guildhall-street, Canterbury	" 27
Goring—Water-Supply Extensions	Thames Valley and Goring Water Co.	George H. Robus, Engineer, Mansion House Chambers, E.C.	" 29
Ipswich—Piling at Alexandra Park	Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	" 29
Newcastle to Annabrough—Railway Extension (4 miles)	Belfast and County Down Ry. Co.	G. P. Culverwell, Eng.-in-Chief, Queen's Quay Terminus, Belfast	" 29
Valletta, Malta—Lift Construction	District Council	The Receiver-General and Director of Contracts, Malta, Valletta	" 30
Tregaron—Service Reservoir	Corporation	J. Davies and Son, A.M.I.C.E., Llanelli	" 31
Swansea—Tramway, &c.	Urban District Council	George Bell, Borough Surveyor, 13, Somerset-place, Swansea	" 31
Kingsbridge—Waterworks	Corporation	T. W. Latham, Engineer, Kingsbridge	Nov. 2
Cromer to Mundesley—Railway (9½ miles)	Norfolk and Suffolk Jnt. Ry. Committee	William Marriott, Engineer, Melton Constable, Norfolk	" 2
Llanwtydy Wells—Storage Reservoir (262,500 gallons)	Bulth Rural District Council	R. L. Bamford, Surveyor, Wildemarsh-street, Hereford	" 16
New York, U.S.A.—Tunnels from Sixth Avenue to East River and Long Island City	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	Dec. 15
New York, U.S.A.—Tunnels under Thirty-second-street, Manhattan, and North (Hudson) River	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
New Jersey, U.S.A.—Tunnels under Bergen Hill and North (Hudson) River	P., N.Y., and N.Y. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
Cairo—Three Road Bridges over the Nile	Ministry of Public Works	The C. Intel. Branch, Board of Trade, 53, Parliament-st., S.W. (1904) Feb.	1
Perth—Engine and Pumps	Town Council	A. Davidson, Water Engineer, Tay-street, Perth	—

FENCING AND WALLS.

Margate—Toeing Wall, Newgate Gapway	Main Sewerage Board	Ernest A. Borg, C.E., Borough Surveyor, Town Hall, Margate	Oct. 12
Richmond, Surrey—Unclimbable Iron Fencing	Town Council	W. Fairley, Engineer, West Hall-road, Kew Gardens	" 14
Batley—Boundary Walls at Sewage Outfall Works	Metropolitan Railway Co.	The Borough Surveyor, Branch-road, Batley	" 17
London, W.—Wood Fencing	Corporation	R. H. Selbie, Secretary, 32, Westbourne-terrace, W.	" 19
Swindon—Wrought-Iron Unclimbable Fencing	Great Western Railway Co.	The Borough Surveyor, Town Hall, Swindon	" 19
London, W.—Fencing and Gates	Guardians	The Stores Superintendent, Swindon	" 19
Colchester—Wrought-Iron Unclimbable Fence	Borough Council	C. E. White, Clerk, 57, North-hill, Colchester	" 19
Fulham, S.W.—W.I. Entrance Gates and Railings, South Park Hereford—Corrugated Iron Fencing at Cattle Market	Corporation	Francis Wood, A.M.I.C.E., Borough Engineer, Town Hall, Fulham	" 21
Cape Town—Fencing Sheds, Band Stands, Fountains, &c.	International Exhibition	J. Parker, City Surveyor, Mansion House, Hereford	" 22
		The Offices, Palmerston House, Old Broad-street, E.C.	—

FURNITURE AND FITTINGS.

Leeds—Fittings at Cattle Market	Smithfield Club	Fred Mitchell, Architect, 9, Upper Fountains-street, Leeds	Oct. 10
Cork—Fitting-up Stores and Office, Patrick's Quay	Sutton, Ltd.	Samuel F. Hynes, F.R.I.B.A., 21, South Mall, Cork	" 10
Guildford—Furnishing Three Houses	Guardians	W. S. V. Cullen, Clerk, Union Offices, Commercial-rd., Guildford	" 10
Merthyr Tydfil—Furnishing Campsie House	Guardians	Frank T. James, Clerk, 134, High-street, Merthyr Tydfil	" 15

PAINTING.

Pontefract—Free Library, Salter-row		Garside and Pennington, Architects, Pontefract	Oct. 10
Shildon—House		Walsh and Nicholas, Architects, Museum Chambers, Halifax	" 10
Manchester—Mayfield and Leaf-street Baths	Baths Committee	The City Architect, Town Hall, Manchester	" 12
Leeds—Moor Bridge, Whitehall-road	Corporation	The Town Clerk's Office, Town Hall, Leeds	" 12
High Spenn—House, Hugar-road	J. Bell	Thos. H. Murray, Architect, Consett	" 12
Birkenhead—Workhouse Buildings at Tranmere	Guardians	John Carter, Clerk, Union Offices, 45, Hamilton-sq., Birkenhead	" 12
Leeds—Detectives' Offices at Town Hall	Covered Market Co., Ltd.	The City Engineer's Office, Municipal Buildings, Leeds	" 12
Workington—Market	Urban District Council	The Secretary, 21, Washington-street, Workington	" 13
Wellingborough—Council Chamber Exterior	North-Eastern Railway Co.	J. T. Parker, Clerk, 29, Church-street, Wellingborough	" 13
York—Offices	Consett Iron Co., Ltd.	Wm. Bell, Architect, York	" 14
Dewsbury—Interior of Infirmary		Charles J. Abbs, Secretary, Dewsbury	" 15
Dewsbury—Warehouse		Holtom and Fox, Architects, Corporation-street, Dewsbury	" 17
Consett—Steel Melting Shops and Rolling Mills		The Engineer, Company's Office, Consett	—

PLUMBING AND GLAZING.

York—Offices	North-Eastern Railway Co.	Wm. Bell, Architect, York	Oct. 14
Bristol—School, Air Balloon-hill, St. George	Education Committee	La Trobe and Weston, Architects, 20, Clare-street, Bristol	" 22
Bridge of Allan—Ramsay's Sanatorium		Charles G. Soutar, Architect, 30, Whitehall-street, Dundee	—

ROADS AND STREETS.

Manchester—Asphalting School Playgrounds	Education Committee	The Education Offices, Deansgate, Manchester	Oct. 10
Hanwell, W.—Road Works	Urban District Council	Sidney W. Barnes, A.M.I.C.E., Surveyor, Hanwell	" 12
Rhymney—Roads and Drains	Twyn Carno Building Club	T. Rogerick, Architect, Giebeland, Merthyr Tydfil	" 12
Nantymoel and Blaenarw—Street Works	Ogmore and Garw U.D.C.	H. Dawkin Williams, Surveyor, Blackmill, near Bridgend	" 12
Stockton-on-Tees—Private Street Improvement	Corporation	M. H. Skyes, Borough Engineer, Town Hall, Stockton-on-Tees	" 12
Bingley—Street Works	Urban District Council	H. Bottomley, Surveyor, Town Hall, Bingley, Yorks	" 12
Teignmouth—Remodelling Teignmouth and Shaldon Bridge	Paving Committee	E. J. F. Tozer, Clerk, Teignmouth	" 12
Manchester—Street and Passage Works	Urban District Council	The Surveyor's Office, Paving Department, Town Hall, Manchester	" 12
Beckenham—Making-up Roads	Corporation	John A. Angell, Surveyor, Beckenham	" 12
Keighley—Paving Industrial and Hive-streets	District Council	W. H. Hopkinson, A.M.I.C.E., Borough Engineer, Keighley	" 13
Willesden, N.W.—Roadmaking, &c.		C. Claude Robson, M.I.C.E., Dyne-road, Kilburn, N.W.	" 13
Salford—Street Works		The Borough Engineer's Office, Town Hall, Salford	" 13
Hornsey, N.—Road Works		E. J. Lovegrove, Engineer, 99, Southwood-lane, Highgate, N.	" 13
Cowbridge and Pontyclun—Widening Main Road	Glamorgan County Council	T. Mansel Franklyn, Clerk, Westgate-street, Cardiff	" 14
Nelson—Private Street Works	Sewage and Streets Committee	B. Ball, A.M.I.C.E., Borough Engineer, Nelson	" 14
Walworth, S.E.—Concrete Roadway	Southwark Guardians	G. D. Stevenson, Architect, 13, King-street, Cheapside, E.C.	" 16
Stockport—Street Works	Highways and Sewers Committee	John Atkinson, A.M.I.C.E., Borough Surveyor, Stockport	" 16
Pontypridd—New Road (Viaduct and Bridge)	Urban District Council	Reginald P. Wilson, C.E., 66, Victoria-street, Westminster	" 16
Preston—Paving Roads	Corporation	The Borough Surveyor, Town Hall, Preston	" 16
Bexhill—Street Works	Corporation	G. Hall, Borough Surveyor, A.M.I.C.E., Town Hall, Bexhill	" 16
Winghamore Hill, N.—Keighley, &c.	Southgate Urban District Council	C. G. Lawson, C.E., Surveyor, Palmer's Green, N.	" 16
Woodville—Street Works	Hart-horne and Seals R.D.C.	Geo. Farmer, Clerk, Ashby-de-la-Zouch	" 2
Ealing, W.—Road Works	Town Council	Charles Jones, M.I.C.E., Borough Engineer, Town Hall, Ealing, W.	" 2

SANITARY.

Downpatrick—Fewer	Rural District Council	R. L. Morrow, Executive Sanitary Officer, Downpatrick	Oct. 1
Briggwater—Middlezoy Drainage Works	Rural District Council	W. A. Collins, Engineer, 120, West-street, Briggwater	" 1
Rawmarsh—Sewer	Urban District Council	J. W. Bellamy, Clerk, Council Office, Rawmarsh	" 1
Hastings—Sewer	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	" 1
Basford—Sewage Works	Rural District Council	Elliott & Brown, Engrs., Burton Bldgs, Parliament-st., Nottingham	" 1
Leeds—Range of Urinals at Woodhouse Ridge	Rural District Council	The City Engineer's Department, Municipal Buildings, Leeds	" 1
Briggwater—Combwich Sewer	Corporation	W. A. Collins, Engineer, 120, West-street, Briggwater	" 1
Reigate—Sewers, &c.	Urban District Council	The Borough Surveyor, Municipal Buildings, Reigate	" 1
Ilford—Sewage Works Extension	Rural District Council	H. Shaw, A.M.I.C.E., Town Hall, Ilford	" 1
Durham—Sewage Works	Main Sewerage Board	Geo. Gregson, Surveyor, 38, Saddler-street, Durham	" 1
Richmond, Surrey—Sewer Entrance Shafts	Westminster City Council	Wm. Fairley, Engineer, West Hall-road, Kew Gardens	" 1
London, S.W.—Sewer, &c.	Borough Council	The Works Dept., Westminster City Hall, Charing Cross-rd., W.C.	" 1
Greenwich, S.E.—Convenience, Blackwall-lane	Urban District Council	The Borough Engineer's Office, Town Hall, Greenwich-road, S.E.	" 1
Hendon, N.W.—Sewer, &c.		S. Slater Grimley, Engineer, Council Offices, Hendon	" 1

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STREET FACADES.

THE clearing of a large area of old buildings between the Strand and Clare Market for the formation of the new crescent called "Aldwych," the pulling down of many old and interesting brick houses in New Inn, and the gradual rebuilding on the old sites of palatial structures for public and business purposes, present to the mind of the profession many problems of more than passing interest. The most obvious question that will arise in the architect's mind will be, What will be the effect of the scheme? Will it be so immeasurably superior to the old order of building that the great outlay will be compensated by the greater convenience obtained by the public? As a means of uniting the great thoroughfare of Holborn with the Strand, and forming an approach northwards, no one can dispute the usefulness of the scheme, especially when at the same time it has cleared a site crowded with unhealthy dwellings and tenements, and will, by adding to the area of new roadways, enlarge the breathing space in so important a centre. If we were to take the pre-existing plan of the neighbourhood north of the Strand at this point, and compare the map of closely-packed houses with the area thrown open in the new crescent and the new thoroughfare of Kingsway going northwards, it would be seen that a large percentage of the cleared area is open to the public, and will remain so—several acres of space, in fact, are added. This alone must increase the healthfulness and salubrity of the Strand and its neighbourhood. There will be, as a consequence, more sunlight and air distributed over a large area. These physical advantages of the new scheme are great, but they are not all. We have reason for hoping that the new arrangement will enable us to improve the architecture of this portion of the Strand. We are justified in hoping that such a wholesale demolition of undesirable property will be succeeded by a reconstruction worthy of the Metropolis, and of our era—that the new sites will be occupied by buildings of architectural character and dignity which will reflect credit on the municipal administration and the nation. Such a hope is not extravagant after so many admitted failures, which ought to have taught us something. We are not in the secrets of the committee intrusted with the practical development of the scheme, but the experience which they have had, the suggestions that have been made, and the result of the competition which they promoted ought to guarantee to the public frontages towards the Strand and Aldwych worthy of the best architectural skill. We have yet only two contributions to the main frontage, and these are far apart, both locally and architecturally. One "unique" position is advertised on a large board at the eastern end of Aldwych as worthy to be filled by an important edifice, and several other sites are open along the crescent and its junction with "Kingsway." To the architectural mind there are certain questions of considerable moment. The unique opportunity of rebuilding a considerable part of the Strand, and designing one extensive frontage to that thoroughfare, raises the question of the claims of a formal style of architecture. The subject may be looked at both from the occupant's and from the outsider's standpoint. By the former the house, as a unit, is regarded as the logical outcome of the individual requirements; the need of the tenant finds its own

expression in each street front. It shapes itself from within as a natural organic form does, and its development is one with the perfection of its outward form. So says Coleridge: "Each exterior is the physiognomy of the being within." There is reason in this view of the case: two individuals will have differently-expressed exteriors side by side; both houses are well expressed, but irregular, and the whole elevation or *ensemble* of a street so made up is an irregular sequence. Nearly all our streets are illustrations of this law of organic growth from within. Their very diversity is charming and picturesque, for they present the variation of human life and habits and character. The author of a paper on this subject, read before the Institute some time ago, discusses the question from both sides. He says, advocating the formalist's view, "the street passenger is in much the same position with regard to the street wall dividing him from the man in the house as an adjoining owner with regard to the party-wall. In the latter case the law recognises right of joint ownership, and in the former case street passengers might fairly claim to exercise certain rights over a moiety at least of the front wall, and if their claim were admitted the overwhelming suffrage of the street folk would impose an architecture conforming truly *usui civium*. Irregularity would be confined to the inside of houses; then would street architecture be formal." This argument assumes that "within" and "without" are relative terms, and that the man in the street is the "being within," for he is beyond the walls that flank the street. This is rather straining the argument from a purely practical point of view, yet in one way at least we must confess that the man in the street has a better right to appreciate street architecture than the man in the house, who in this argument is the "outsider." The tenant regards the house only in its immediate surroundings and relation to himself; while the man in the street can see the whole.

There are several arguments used against formal treatment which we may just glance at. Those who prefer the irregular in street building disclaim any intention of breaking through legislative enactments or rules of convenience. Thus they refer to the frontage lines of houses prescribed by the Act, to straight lines of front, to the limitation of height, avoidance of projecting features, &c. But these matters of regularity and economy in building rather point to the advantages of formal architecture, with which they are in antagonism. Again, it is argued the formal treatment discourages the convenience of tenants, and would impose on them stereotyped arrangements quite subversive of individual wants and trades, therefore it is charged with falseness and hypocrisy; but these charges may be refuted by an appeal to Nature herself, which the advocates of irregularity are constantly bringing to support their ideas. The duality of the functions of the human body and its symmetry, the structure and functions of plant life, contradict the doctrine that every part of a structure must express externally its use. Nature at least shows us in many organic forms symmetry and regularity of features which are not always the result of use, and which are really as formal in arrangement as any building can show. On the other side, we have to consider the architecture of our streets from the point of view of the outsider. As we understand that individual, he looks at the external appearance, and does not trouble much about the inside convenience of the houses which compose the street. The public, whom the man in the street represents, look for character, for an expression of building which exhibits a breadth and largeness of character, for something that transcends the mere individual tenant, which exhibits architectural unity, rhythm, and dignity, and from this point of

view there is much to be said. The "irregular" or individualistic idea of architectural design is comparable to the analogous theory of individualism which ascribes all progress to individual exertion rather than to the society; but the formal theory of design expresses the broader view of social well-being, in which the community is the unit instead of the individual. It is, in a word, collective and national in its aims. The irregular style is based, as we have seen, in the individual growth of within outwards. The "use" of the building is the chief motive in the design; but if this is so, a building designed for one purpose, like a shop, should always remain the same. Directly it changed hands the design would, according to this theory, be wrong, inconsistent, and untrue. But we cannot be always changing the front directly another trade comes to occupy the house. This would be costly and needless expense, so that this theory does not work. It is not logical. We cannot be always putting a new front on our building directly it changes hands, or is used for some other purpose. Yet this is the theory of variable "use" which the advocates of irregularity contend for. The formal system of design is more consistent. It is based, not on the mere accident of a certain use, but on a broad tendency which is more uniform. We can illustrate this by referring to certain localities in London to which certain trades and industries gravitate. Thus we see Long Acre used by carriage builders, Bond-street by picture galleries, Regent-street by various fancy trades, drapery, millinery, and jewelry, and other localities are associated with businesses and trades of particular kinds. In each of these we shall find the formal treatment of façade more general. One common objection to formal design is that it is dull and monotonous, and without character. But it need not be so. We do not wish to see reproduced the street design of Regent-street, Gower-street, and other parts of Bloomsbury, where one house is exactly a repeat of another. The President of the Manchester Society of Architects, Mr. J. W. Beaumont, spoke in his address of the value of variety in street architecture; but he also dwelt on harmony, and the necessity for control. Formal design does not imply mechanical repetition, yet we may desire to see a general character given to a street, instead of making it a collection of diverse units of odds and ends. Certain trades and occupations have the tendency, as we have said, of localising in particular streets; but they would not do so very readily if irregular street architecture was the fashion, and any pronounced street fronts were built. The tendency of street building is towards a formal treatment, as we may see in all large towns where a character for respectability prevails. No one likes to appear eccentric just for the sake of eccentricity. There is something imposing in formality, for it enables the artist to gather up his forces and present them united as a phalanx; the ordinary features, such as windows, are repeated with telling effect in a great length of façade which by themselves are very insignificant; and this effect is increased when the architect varies his masses, or repeats at intervals a feature like a pediment, a dome, or a colonnade, or a break, and crowns the extremities by pavilions or cupolas. There is also a consideration for others which it expresses externally. The passer-by in the street is not concerned to know every tenant's trade, or taste, or eccentricity; for him at least there should be a complacent manner—a kind of "politeness," or etiquette, that is expected by the outsider to whom we wish to show respect. The formal design expresses just such a complimentary way of consulting the tastes and feelings of others. So the architect, in adopting the formal or ceremonious method of design, will not disregard the larger city, the feelings of others

who are constantly using and parading the street; he will not purposely accentuate the disagreements of adjoining owners who like to proclaim their individual tastes in the most offensive manner. These are a few of the advantages of the formal method of design. But do not the qualities of unity, rhythm, order, and symmetry count for something as well? Compare Paris before Napoleon III. began its remodelling with its streets and boulevards now; we have lost a great deal of picturesque irregularity that made "Old London" so charming to the artist, but have we not gained by wider streets and promenades, safer and better construction and regularity?

There are certain recurring features in the formal style which deserve to be noticed. The dome or cupola is one of the most important; but its employment ought always to mark either the centre or termination or some other prominent position in the plan. We can tolerate it in the centre of a long façade over the hall or vestibule, or on salient angles of wings; but the modern professor often introduces it in all sorts of places just as an ornament, or to give height and prominence. In a large number of instances its introduction conceals poverty of design. It is so easy in a long façade to stick on a cupola at each corner, and to flank every projecting entrance with small cupolas. The mansard or pavilion roof is another feature which the modern architect affects; but, like the dome, it can be used too often and without any motive. Replicas of the Louvre on a small scale and for ordinary purposes might easily be made grotesque and provoke a smile, in the same way the tail Mansard roof may become a ridiculous travesty when placed on certain street façades at intervals. Just now there is a craze for corner cupolas in streets. When tastefully designed, and in keeping with the building, they are pleasing breaks to the skyline, and serve to accentuate the entrance; but we may have too many of them, and then they look pretentious and self-assertive. The colonnade is a feature which is also used to give variety to a long façade, and when adorning a building of some magnitude is an imposing alternative. On the other hand, it may become positively ridiculous when applied to a small building or an insignificant row of houses, in the same manner as the dome may look grotesque when placed on a small building. The colonnade, by relieving the front of a building, or used as it is on the Embankment front of Somerset House, or in the Louvre, in the upper story at intervals between the plainer portions of the façade, adds greatly to the general effect. In the new Gaiety in the Strand it has made a pleasing relief to a solid and bare substructure, but we refer mainly to its value as a feature in street composition. In southern aspects the colonnade, or a screen of columns before the plane of wall pierced by windows, may be found of service even in this northern clime if the wall front is not too much recessed, so as to cast a deep shadow. In view of the new Strand frontage these considerations are worth attention.

Several important buildings will shortly be erected in close proximity to the new Gaiety. A large block of buildings in Aldwych is to be built near the Gaiety, comprising the Waldorf Hotel, Mr. E. G. Saunders's new theatre, also to be known as the Waldorf, and a playhouse for Mr. Murray Carson. The excavations have been in progress, and a large area, it is stated 26ft. deep, 120ft. long, and 70ft. wide, has been made for the underground grill-room of the hotel. The frontage of this block will be 470ft. in length, and the hotel will be situated between the two theatres. We understand Mr. A. Marshall Mackenzie is the architect for the hotel, which will be in the Louis XV. style. The stone front will have a colonnade and two balconies, and will be flanked by towers. A row of

shops will occupy the ground story. The hotel will contain 350 rooms, with baths to each suite. A terrace lounge and garden form part of the design. The theatres are from the designs of Mr. W. G. R. Sprague, and will be in the Italian Renaissance style. The buildings will cost about £500,000.

Attention has been drawn by Mr. Mark H. Judge, in the *Times* of last Monday, to the memorial of the Further Strand Improvement Committee about to be presented to the London County Council, in which the committee support the proposal to set back the eastern horn of the crescent of Aldwych in line with the western horn (on which the New Gaiety stands), and thus give the roadway its natural course to the Law Courts, which deviation will bring the church of St. Mary-le-Strand into line with the thoroughfare, and will provide an island pavement where trees could be planted. The proposals can be secured, it is stated, by a sacrifice of about 85ft. of building frontage. The new thoroughfare running in a northerly direction from the centre of Aldwych, called the "Kingsway," is also making progress, and already the operation of widening the streets at the northern end is begun, and will give some idea of the promenade. Will the architecture of this fine thoroughfare, the most important formed since the Thames Embankment, be equal to the opportunity? At present we have no means of ascertaining. Years will elapse before the public will be able to judge. As a perfectly straight route, the claims of a formal treatment of elevation will unquestionably be strong, yet we should be sorry to see a too rigid application of any one style; we look rather for a compromise between the formal and irregular style, in which both Classic and Gothic may find a suitable expression.

ADVICE TO STUDENTS.

ALREADY the architectural societies are astir, and one or two addresses of professional interest have been given. The President of the Architectural Association delivered a short address on a variety of educational topics, which was fully reported in our last issue. The acquisition of the Royal Architectural Museum and the adaptation of the premises to the requirements of the Association was dwelt upon with much satisfaction. It is true, as Mr. Henry T. Hare remarked, the Museum had become "out of sympathy with its environment"; but it was for a long time a witness to the enthusiasm of the Gothic Revival and its far-reaching consequences to the future of architecture. The collection of valuable casts which it contains must have had an educational use in the past, whatever may be said about such means of instruction. The reopening of the day-school of the Association after its first year's work is in itself a notable event. We lately referred to the programme of the courses given at the school, which ought to be welcomed by all pupils in offices, as well as those who are thinking of taking up architecture as a profession, and of enabling them to ascertain their capacity for entering it. The day-student is taught to take an intelligent interest in all that appertains to an architect's office, in building operations, in drawings of details, and other things which are often enigmas to the young beginner. Mr. Hare invited his hearers to inspect the results of the school for themselves, and the progress is said to be most encouraging; he commended it to all parents, guardians, and heads of public schools as a means of testing the aptitude of the student.

The President advised students to study and delineate ancient buildings. Facilities for the delineation of old work are more numerous than ever, easier and more rapid travel to all parts of the world, in which the cycle

and motor have their part, is obtainable. Kodaks and photographic reproductions are all inducements to the cultivation of this valuable means of instruction. We do not mean the only agencies, but still very important ones to the architectural student. No doubt years ago too much stress was laid on the value of drawing; it was regarded by many almost the end of the young architect's efforts that he should be an accomplished draughtsman. Opinions have changed very much since. Instead of being the end, it is now regarded only as a means of study. Every architect knows the great value of the accomplishment, but he knows also that it does not give the power to create new forms, nor to work out a problem in design. Mr. Hare suggests the "deliberate consideration of such studies as are the outcome of demonstration and experience, observation, and research, rather than the perusal of books and the abstract theories of mankind." The recommendation is one needed just now, when the student's attention is directed so much to book knowledge and theoretical instruction. Observation and research are invaluable means, and the President rightly points out the danger of the school usurping all the attention, the valuable work of the studio being neglected. The classroom, necessary as it is, cannot take the place of the workshop or the studio, where the student feels the directness of inspiration. The president also deplores the want of "brains" in the pursuit of architecture, and he says much of the failure which we see in our streets and cities is the result of "old rule-of-thumb processes which are preferred to new developments." Who can doubt this? We have too little of brains. The machinery, the provision of "battleships and big battalions" are useful, but nothing can be done without the organising power.

We commend also to the student the inaugural address on "Architectural Evolution," given at the opening of the London School of Architecture, University College, by Professor F. M. Simpson, which we printed last week. Professor Simpson takes up the work left by the late Professor Roger Smith, who zealously and enthusiastically laboured for students who were during the day engaged as pupils in offices. The pupilage system, as pointed out, is undergoing a change. Not many years ago the pupil learned, or was supposed to learn, everything during his term of articles, assisted by outside lectures, such as those of the School of Architecture which he cared to attend. But of course it was quite voluntary on the pupil's part. Pupilage was then the only method by which the student could be prepared for the profession; it is not so entirely now, though the system will continue, because, as the lecturer said, "only in an office can men get thoroughly in touch with actual practical problems, and learn the inner mysteries of their profession"; but in the future the student must be better equipped for his work in the office by a preliminary training. At the University School a more systematic course of instruction has been instituted. A course of training on the evolution of architecture appears to be an admirable and logical preparation. As Professor Simpson says, "it is not merely a matter of academic interest; it has a practical side, which is to trace the working of a man's mind in his work, to see how, observing the requirements of his time, and adapting himself to his materials, he took an idea from here and an inspiration from there, and so treated them as to give them new expression." The evolution of a style of architecture is really the actual process that ought to go on in the designer's mind. The historical evolution of architecture is well known to our readers; all styles form an unbroken sequence, or nearly so, and the lecturer pointed out how the Romans, not finding the Greek lintel sufficient for their wider and more comprehensive

requirements, adopted the Etruscan arch and their own native materials and cement, by which a concrete could be employed in the construction of arches and vaults which have never been surpassed. Again, we see evolution in the requirements of a rising Christianity, when temples and basilicas were converted into churches. The lecturer pointed out how the evolution or process of change was made step by step. "A wall was built between the columns of the external peristyle, so that the ambulatory became the aisles. Openings were pierced in the naos wall to connect the aisles with the nave, and a chancel was built out at the east end." The posticum of the temple became the porch of the church. So the colonnaded timber-roofed basilica of Rome became the model for the Christian church. Other notable instances of evolution are given, emphasising the fact that all architecture is evolved from previous efforts—that true originality of expression is not merely a fashion, or what is now called "Art Nouveau," but the outcome of previous knowledge and of earlier types. The architect of to-day has to conform to the same method, and to work with similar materials. "All he can do is to try and advance one step further than his predecessors; behind him is a vast store of accumulated treasures, and if he can extract a few of them and infuse into them his own spirit, his own individuality, he has done as much as anybody can expect to do." Some of our "advanced" school of designers may hesitate to acknowledge this statement; but it is confirmed by all former architecture, as in the evolution of one style of Gothic out of the previous one there was no bold departure between any two consecutive phases such as the Early English and Decorated, not even the Transition from Norman to Early English. The mistake of the modern professor of the art is to ignore the gradual evolution of one type from another by selecting a totally different style, and trying to make it suit modern requirements, an eclecticism based on archaeological reproduction and not on reasoning, on traditions learned through the schools instead of the practical requirements of material and use. Professor Simpson illustrates this by referring to the deadening effects of our revivals. He says: "The fine traditions started by Inigo Jones and continued by Wren and his followers were all destroyed by the two revivals of the last century." Again: The Cinquecentists "picked up anew the thread of Classic tradition, which, although entangled for centuries with other threads, had never been entirely lost in Italy. Their work, although not coming in natural sequence like the Byzantine, Romanesque, and Gothic, has still a place in the history of architectural evolution." In the last century, it must be confessed, men sacrificed everything to archaeological correctness, and even later we had the reign of the purists. But the Renaissance artists, like those before them, never allowed tradition to take the place of utility, nor did they abandon science, which had been advancing for centuries. These are the "notes" of the true evolution of architecture. Again, there must be conciliation between the opposite camps, as is pointed out; there must be agreement in essential conditions if the art is to make progress. The workman finds it difficult to obey two opposing schools or styles, and the chaos of our art during the last sixty years is a proof of the confusion. For a real advance, as the lecturer said, between architect, builder, and client harmony is essential. "It existed in the 18th century in England; it existed in the 15th century in Italy; it is the secret of strides made by architecture in the Middle Ages." The rival factions of Gothic and Classicism have to some extent disappeared, but "there are still Classicists, although there are no longer pedants, and there are still Roman-

ticists, although they have ceased to be mock-Medieval." A fusion between the two is the only hope for progress. There are a few signs of such a reconciliation, but the time is not yet. One school is ready to throw over all traditions and to begin afresh, basing their efforts on individual skill; but the results of their labour, though full of enthusiasm, are not satisfying; the opposite school is still intent on precedent in following traditions that are no longer consistent with modern requirements. We must look for a compromise between these hostile camps in which each agrees to work in harmony with the other.

ON BUILDING TIMBERS.—XXXIX.

THEORY OF MEASUREMENTS.

IN describing the wood to be used for the carpenter's work in some buildings, a common clause in specifications (e.g., Tite, Royal Exchange, 1841) was this: "The oak timber is to be of English growth, sound and well seasoned, cut die square, and free from sap and other defects." Though other timber is specified for the carpentry, not a word is said about how it should be sawn, and it is of quite as much importance that scantlings obtained from it should be cut die square; the omission was probably due to the fact that English oak was cut here from the round log, and the other timber was imported already sawn die square. Perhaps the introduction of steam sawing has to a great extent done away with the necessity of making provision of this kind in a specification, for timber converted by gang or circular-saws has much less chance of being cut out of square than logs opened by hand in a sawpit. Whether logs and deals with wane or defective angles can be said to be sawn die square is a question open to dispute, as trade custom, and law which holds that custom, to be reasonable, would probably decide in the affirmative. An architect should, therefore, protect his client by specifying that "all timber must be sawn die square, and measure, after sawing, the full dimensions hereinafter specified; scantlings with wane angles will not satisfy this description." When it is said that timbers are to be sawn die square, it is not meant that they should be actual squares on cross-section; it is only required that any adjoining faces of each piece of sawn wood should be die square, or at right angles with each other. As this description of sawing applies to roofing timbers, joists, plates, studs, and lintels, it follows that these pieces are what mathematicians call parallelepipeds. There are two definitions given of a parallelepiped, or parallelepipedon, namely that it is a solid contained by six planes, three of which are parallel to the other three, and also that it is contained under six parallelograms, the opposite of which are parallel and equal. It may also be said that this solid is a prism whose base is a parallelogram. A prism is a solid contained by planes, of which two that are opposite are equal, similar, and parallel, and all the rest parallelograms; a prism takes its name from the figure of its ends: hence there are triangular prisms, square prisms, pentagonal prisms, and so on. A right prism has its sides parallel to its ends, and an oblique prism is that which has the sides oblique to the ends. Whichever of the above descriptions may be adopted for building scantlings, or for what the Americans call "lumber," the object itself is more familiar to the builder than its name in geometry, and though it is not likely, even with our continuation schools and polytechnics, that a carpenter of the next generation will ask for a "parallelepipedon" instead of a "deal"; still it is necessary to use uncouth and unfamiliar names when formulating rules for ascertaining the true contents of the solids they stand for. All this knowledge may be considered superfluous; but the writer, who is no crank in pedantry, having stood shoulder to shoulder with working men all his life, sees the advisability of adapting scientific names for geometrical figures, as they may be applied generally to the various shapes of all materials used in building, and technical, popular names could not be so used, their signification being limited. For example, to fix a rule for finding the solid contents of a deal would seem to imply that the rule would not be applicable to a squared log, a door-step, or a block of stone; but when a rule is given for finding the solid contents of a

parallelepiped or any other figure, that rule may be applied to all material having the same figure. The contents of a solid does not depend on the material in it, but on the dimensions of its bounding surface or surfaces; hence solids are classified and named in geometry, and rules are given for ascertaining their contents without regard to the substances in them, or to their trade uses.

The contents of a parallelepiped are obtained by "multiplying the base by the altitude," that is, the area of the base by the height, both dimensions being all in feet or all in inches. Let it be required, for instance, to know the contents of a deal 12ft. long, 11in. wide, and 4in. deep. Here the base area is 44in. (11 by 4), and the height 144in. (12 by 12). The contents is therefore 6,336in. (44 by 144), which, being divided by twelve three times, to bring the inches to feet, gives 3ft. 8in., the content required. It is evident in this calculation that multiplying 12 by 12, and afterwards dividing by 12 and 12, is superfluous work, for these operations neutralise each other, and may be omitted; hence the content of any piece of wood 12ft. long may be obtained directly by dividing the area of the base in inches by 12, the length in feet. A wooden post is 12ft. long, and 9in. by 6in. square. What is its content? $9\text{in.} \times 6\text{in.} \div 12 = 4\text{ft. 6in.}$, the answer required. Again, a flitch of pitch-pine is 12ft. long and 19in. by 8in. square, what is its content? $19\text{in.} \times 8\text{in.} = 152\text{in.} \div 12 = 12\text{ft. 8in.}$, the content required. All these calculations may be performed mentally, and multiples of 12ft., as well as submultiples, may be calculated for in the same easy way. When the length is not 12ft., or any multiple of 12ft., the work is done thus:—Say, for example, it is required to find the content of a deal 17ft. long by 9in. wide and 6in. thick. Here the area of the base is 54in., and this multiplied by the length in inches 204 (17 \times 12) gives 11,016in., which divided by 12 three times gives 6ft. 4in. 6pt., the content required. In this calculation the process may be shortened by omitting the multiplication by 12 in the first part, and dividing the two 12's only in the latter part, thus: $17 \times 54 = 918 \div 12 = 76\text{ft. 6in.} \div 12 = 6\text{ft. 4in. 6pts}$. From this the following rule may be deduced:—To find the content of any piece of squared timber, divide the area of the base in inches by the length in feet, and the quotient divided by 144 will give the content required in feet and parts of a foot. In cross-multiplication the calculation would be performed in this way:—

17ft. 0in.
0 9
0 0
12 9 0
12 9 0
0 6 0
0 0 0
6 4 6 0
6ft. 4in. 6pt. 0sec.

By proportional parts the calculation is much shortened as follows: 17ft. \times 9in. is the same as 17ft. $\times \frac{3}{4}$ ft. = 12ft. 9in., and this again multiplied by 6in. is the same as being multiplied by $\frac{1}{2}$ ft., then 12ft. 9in. $\times \frac{1}{2}$ = 6ft. 4in. 6pt. Familiarity with these calculations will enable anyone after a little practice to curtail them considerably by various "short cuts," which will suggest themselves in the course of the work. A number of ready reckoners, "Hoppus" amongst them, have been compiled to give at a glance, or rather at two glances, the content of unequal-sided timber, and the method adopted is this. The "equivalent square" of any rectangle is first given in one series of tables, and the content of square timber of various lengths in another set of tables; hence, when the contents of any piece of timber are required, the equivalent square of its end section must first be found, and the contents, according to its length, will then be seen in another table. Take, for instance, the deal last mentioned: its end section is 9in. by 6in., and its area 54in., the square root of which, $\sqrt{54}$, gives the side of its equivalent square, or $7\frac{1}{4}$, as Hoppus puts it; opposite 17 in the $7\frac{1}{4}$ in. column of Hoppus's "Cubical Measure," is 6ft. 2in. 5pt., the content required. In these tables the $7\frac{1}{4}$ is approximate (for $\sqrt{54}$ is not $\frac{1}{4}$), and the content is also approximate, being 2in. and 1pt. short. The advantage gained by reducing rectangular areas to their equivalent squares is that a much shorter table is required to ascertain the contents, for the

square "7 in." will do for 9 in. by 6 in. stuff, as has been shown; and it will also answer for 12 in. by 4 in., 18 in. by 3 in., and other sizes also. Where accuracy is required, this method of calculating content of equivalent squares must not be used—in fact, it may be said that it is a rough-and-ready way, for those who are ignorant of the simple rules of arithmetic, to find the content approximately of any block of wood or stone. When the sides of a piece of timber taper regularly it is a frustum of a pyramid. A pyramid is a solid having any plane figure for its base, and its sides triangles whose vertices all meet in a point called the vertex of the pyramid, the base of each triangle being the sides of the plane base of the pyramid. A pyramid is also defined to be a solid contained by a plane polygonal base and other planes meeting in a point. Pyramids are triangular, quadrangular, pentagonal, &c., according as the base is a triangle, a quadrangle, or a pentagon. A cone is a round pyramid: that is, one having an infinite number of sides. The quadrangular pyramid is that only which will be dealt with here, for many sawn and hewn logs are frustums of such a pyramid.

The axis of a pyramid is the line from the vertex to the centre of the base; when this axis is perpendicular to the base it is a "right" pyramid, and when it is inclined the pyramid is "oblique." Pyramids have the following properties:—(1) All pyramids having equal bases (in area) and the same altitudes are equal to one another, no matter what the figure of the base may be. (2) Every pyramid is equal to one-third of the circumscribed prism, or a prism of the same base and altitude; therefore the solid content of a pyramid is found by taking one-third of the product of the base and perpendicular height. If a pyramid is cut by a plane parallel to the base, the content of the frustum (or part between the base and the section) is equal to the sum of three pyramids, each being of the same height as the frustum, and their bases being respectively the lower base of the frustum, the upper base, and a mean proportional between them.

A mean proportional between any two number is the number obtained by extracting the square root of their product; for instance, let it be required to find a mean proportional for the numbers 13 and 18: these multiplied give 234, the square root of which is 15.297 the number required, the proportion is stated thus, 13 : 15.297 :: 15.297 : 18. To find the solid content of the frustum of a pyramid, add into one sum the area of the two bases and the mean proportional between them. Then one third of this is a mean section of the base of a prism of equal height; therefore this mean area multiplied by the height gives the solid contents. To apply this rule let it be required to find the content of a regularly tapering log of timber 18 in. square at one end, 13 in. square at the other end, and 40 ft. long. The area of the greater base is 324 in. (18 by 18), that of the lesser base 169 in. (13 by 13), the mean proportional between these is 234 ($\sqrt{324 \times 169}$), the three added make 727 (324 + 169 + 234), which multiplied by 40, the length gives 29,080; one-third of this (9693.333) divided by 12 and 12, to bring inches to feet, is 67.315 ft., the content required. A second rule is: Multiply the area of the greater end by one of its sides, and that of the smaller end by one of its sides (it is assumed that the sides are equal); divide the difference of the products by the difference of the sides, and multiply by one-third the length of the log. For example, taking the same dimensions as before: Area of the greater end multiplied by its side 5,832 (324 × 18), area of lesser end multiplied by its side 2,197 (169 × 13), their difference 3,635 (5,832 - 2,197) divided by 5 is 727, and this multiplied by 40 (the length) and divided by 3 and 12 twice gives 67.315 ft., the content required. A third rule is to divide the difference of the cubes of a side of each end by the difference of these sides, and multiply the product by the height, one-third the result will be the solidity. Taking the same dimensions as before and applying this last rule, the cube of 18 is 5,832 (18 × 18 × 18), the cube of 13 is 2,197 (13 × 13 × 13); these cubes added make 3,635 (5,832 + 2,197). This sum multiplied by the height is 29,080, which, divided by 3 and 12 and 12, gives the content to be 67.315 ft. as before. The popular way of measuring this log is as follows:—A mean quarter-girth is taken at 20 ft. along the log; it would be 15 in. This squared and multiplied by the length is 66.736 ft., which is .579 too little,

or more than half a cube foot. Suppose, now, that this 40 ft. log is split down the centre, and that the content of the flitches are calculated by the quarter-girth method, what will they cube to? The mean section of each flitch will be 15 in. by 7 in., and the quarter-girth 11 in. (nearest by Hoppus); the content of each flitch will therefore be 36 ft. 8 in. 10 pt., and of the whole log 73 ft. 5 in. 8 pt., or 5 ft. too much! The quarter-girth system for measuring squared logs which do not taper considerably gives a result not very much out; but for measuring flitches rectangular on section it is wholly absurd. The only accurate way of ascertaining the contents of a log which is square on section and tapers regularly, is by applying one of the three rules given above; the first rule is applicable to unequal-sided timber, the second may be adapted to it, and the third should be applied only to logs with equal sides or square timber. The next geometrical solid which is frequently represented in converted building timber is the cylinder: it has two circular ends, and every plane section parallel to the ends is a circle equal to them also. When the side of a cylinder is perpendicular to the ends it is a "right" cylinder, otherwise it is "oblique"; the solid content of any cylinder is equal to the area of the base multiplied by its perpendicular altitude. A cylinder is to its inscribed square as 3 to 2, and to its inscribed curve as 3 to 1; that is, if a globe contains 2c. ft., the cylinder which exactly incloses it will contain 3c. ft., and the curve described in the cylinder, having the same base and height, will contain exactly 1c. ft. All sections of a cylinder parallel to the ends are circular, and all oblique sections are ellipses. In this connection it may be mentioned that a circle and ellipse are two distinct curves, and that an ellipse cannot by any possibility be constructed with circular curves, no matter how many may be employed, or how minute they may be. A circle is described from one centre with a fixed length of radius; whilst an ellipse is struck from two centres with radii which are constantly being altered in their relative lengths as the curve is generated. Applying the rule given above to find the contents of a cylindrical log 15 ft. long, and girting 42 in. First the area of the end must be found: the circumference squared will give this when multiplied by the constant .07958, $42 \times 42 \times .07958 = 140.379$; this area multiplied by the length 15 ft. gives 2105.685, which, divided by 12 and 12, show that 14.623 ft. is the content of the log. Working by Hoppus, the greater girth is 10 in., and the content for 15 ft. long by 11 ft. 5 in. and 9 pt., an amount too little by 3 ft. 2 in. and 5 pt. The error arises in assuming that the greater girth of the log is the side of a square the area of which is equal to the area of the end of the log. Here the side of such a square is 11.848 in. (circumference 42 in. by .2821 in.), and not 10 in. It is therefore impossible to ascertain by "Hoppus" the correct content of cylindrical log. The content by Hoppus will, however, always find favour in the trade, for it is considerably under the true content. The next regular solid, but one which does not occur very often in builders' work, is the cone, a round pyramid in fact, having a circle for its base, and its sides formed by right lines drawn from the circumference of the base to a point at the top, being the vertex of the cone. When the axis of a curve—that is, the line drawn from the vertex to the centre of the base—is perpendicular to the base, it is a "right" cone. When that axis is inclined to the base, it is an "oblique" cone. It has been explained that every line is equal to the third part of a cylinder of equal base and altitude; therefore the solid content of a cone may be found by multiplying the base by the perpendicular height and taking one-third of the product. For example, let it be required to find the content of a cone girting 42 in. round the base, and whose height is 12 ft. Here the area of the base is 140.379. This, multiplied by the height, gives 1684.548, one-third of which, 561.516 in., gives the content to be 4c. ft. nearly, 3.89 ft. exactly. Taking the mean girth at 21 in., quarter of which is 5 in., the solidity would be 2 ft. 3 in. and 6 pt. by Hoppus. The trunk of a tree tapers as it rises from the ground; the branches also taper, and both are nearly circular on plain sections taken at right angles to the line of upward growth. The nearest geometrical solid to the shape of a trunk of a tree, or its branches when trimmed, is a frustum of a right cone. The frustum (Latin "a fragment") of a cone is that part which is left

after cutting off the top by a plane parallel to the base, it is also any part lying between two planes which may be either parallel to or inclined to each other. The first kind of frustum will only be dealt with here, as it is a very close representation of the figure of round timber before it is converted. Few trees are exactly circular on transverse section, and fewer still have straight sides: it follows that as all rules for ascertaining the content of geometrical solids are determined for figures bounded by perfect circles or other regular curves and straight lines, when these rules are applied to tree trunks the calculated contents will be approximate only, and the accuracy of this approximation will vary as the cross section of the trunk varies from a circle, and the sides from straight lines. There is no possible way of ascertaining the exact content of a tree, nor is it required in practice that it should be done with mathematical accuracy; still, a content can be obtained which will be found accurate enough for all purposes, and this by the application of rules known and adopted by all skilled geometicians for the last 2,000 years or more. How to obtain the content of a cylinder has already been explained; but the rule for doing it will not help to find the contents of the trunk of a tree, for it tapers, and a cylinder does not, so that a rule which may be adapted for one will not apply to the other. The contents of a tree, that is, round tapering timber, must be calculated as if it was the frustum of a right cone, the nearest geometrical figure which it approaches in shape. There are several rules for obtaining the contents of the frustum of a cone, and all of these involve calculations which will be considered elaborate or otherwise as the operator is skilled in figures or unaccustomed to them; but a very slight knowledge of mathematics will enable anyone to apply the rule without much trouble. Rule 1. Add together the squares of the diameters of the greater and less ends, and the product of the two diameters; multiply their sum by .7854, and this product by the height. This last amount divided by 3 will give the contents required. This rule may be modified thus: Multiply the squares of the diameters added to their product by the height of the frustum, and then by .2618, and the result will be the solidity; here the process is shortened by dividing the constant in the rule .7854 by 3, and multiplying by the new constant .2618 found by that division. Rule 2. Add together the squares of the circumferences of the greater and less ends, and the product of the two circumferences. Multiply their sum by .07958, and this by the height; the last product divided by 3 will give the contents. This rule may be modified in this way: To the square of the circumference of the two ends add the product of their circumferences, multiply the sum by the height of the frustum, and the product by .02652 for the solidity. Here, as in the last case, the process is shortened by dividing the constant .07958 by 3, and obtaining a new constant .02652. This dispenses with multiplication by a high figure, and the subsequent division by 3. Rule 3. Find the mean proportional between the areas of the ends, add it to the areas of the ends; one-third of the sum will be the area of the base of a cylinder having the same height as the frustum, and this area multiplied by the height will give the content. The mean proportional between the area of the ends is found by extracting the square root of their product, as has been already explained, so that this rule may also be expressed in this way. Add to the areas of the two ends their mean proportional, and multiply the sum by the height of the frustum, and one-third the product will be the content. If S denote the solidity of the frustum required, D the diameter of the greater end, d that of the small end, C and c the circumferences, A and a the areas of the ends, and H the height, then the rules expressed by formulæ are—

$$\text{1st rule—} (D^2 + d^2 + D \times d) \times .7854 \times \frac{H}{3} = S$$

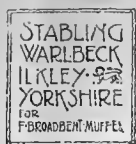
$$\text{Modified—} (D^2 + d^2 + D \times d) \times .2618 \times H = S$$

$$\text{2nd rule—} (C^2 + c^2 + C \times c) \times .07958 \times \frac{H}{3} = S$$

$$\text{Modified—} (C^2 + c^2 + C \times c) \times .02652 \times H = S$$

$$\text{3rd rule—} \frac{H}{3} (A + a + \sqrt{A \times a}) = S$$

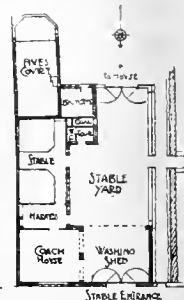
Finding the content of a tapering tree is not, after all, such an easy matter as it looks, judging by the rules just given. Hoppus, in his "Practical Measuring," comes nowhere near it with his "mean" girt and "quarter" girt; in fact, this is so well known that we have now the



WEST ELEVATION



ELEVATION TO THE WEST OF THE ROAD



STABLE ENTRANCE

E. Brantwood Muff.
ARCHITECT.
85 JERMYN ST. S.W.

"true" content of a log and its "sale" content, according to Hoppus, which is not its content at all. Dr. Newton, in his "Cosmographia" (published for Thomas Passinger at the Three Bibles on London Bridge, 1679) says, after describing how to obtain the content of round tapering timber correctly: "Mr. Darling in his Carpenter's Rule made easie, doth propound a shorter way, but not so exact, which is by the circumference given in the middle of the piece to find the square—namely, by multiplying the Circumference given by .28209 or .2821, which side of the square being computed in Inches, and lookt in his Table of Timber Measure, doth give the content of the Tree not exceeding 31ft. in length." From this it appears that so early as 1679 tables for calculating the contents of tapering sawn timber were published, and that they were considered by mathematicians of the time as being merely close approximations to the true content. Mr. Darling did not, however, square his quarter girt, and multiply it by the length of the piece. He found the side of a square, which would in area be equal to the circle of which he took the mean girth, and multiplied this by the length, for the content of the tree. In Darling's method, the side of his equivalent square would, say for a girth of 50in., be 14.1in., whilst Hoppus would have made it only 12.1in., the area in the former case being 198.8in., and in the latter case only 156in.

In the next article, the opinions of various writers, "ancient" and modern, on the Hoppus method of measurements by quarter-girth will be given, and it will be shown that his way for obtaining the content of timber was never recognised as being correct by anyone who knew what he was writing about. In dealing with the dimensions of round timber, with a view to secure accuracy in calculating areas and contents, the following memoranda will be found useful: (1) The circle has not yet been squared, so that it is not possible to calculate the circumference and area of a circle from its diameter; the most accurate rules give, after all, only very close approximations to the real truth. (2) For the length of its boundary, a circle incloses a greater area than any other figure; a circle whose circumference is 3ft. 6in. will inclose a superficial foot, a square inclosing the same area will have sides 1ft. long each, or 4ft. in all. (3) The area of circles are to each other "as the squares of their diameters." This means that a circle twice the diameter of another circle will inclose four times its area; the end of a scaffold pole 6in. in diameter will have an area of 28.274in.; but a cylindrical log having a diameter of 12in. will have an area 113.097in., or four times as much. Again, a circular pipe 3in. in diameter will have an area of 7.0686in., or nine times as much as a pipe 1in. in diameter, the area of which is .7854. (4) A circle whose circumference is twice that of another circle will contain four times its area; three times the circumference will inclose nine times the area, and so on. (5) The circumference of a circle may be obtained nearly by multiplying the diameter by

3.1416; this is not the exact proportion, for the reason stated in No. 1. (6) The diameter of a circle may be obtained nearly by dividing the circumference by .31831. The area of a circle may be obtained nearly by multiplying the square of the diameter by .7854. (8) The diameter of a circle is obtained nearly by multiplying the square root of its area by 1.2837. (9) The girth of a circle—that is, its circumference, multiplied by .2821, will give the side of a square of equal area. For instance, a tree girths 64in.; what is the side of a square equal in area to a section taken at the place of girding? Here $64 \times .2821 = 18.0544$ in. (10) The diameter of a circle multiplied by .8862 will give the side of a square of equal area; a circle 30in. in diameter will be equal in area to a square whose side is 26.586in. ($30 \times .8862$). (11) A circle the area of which is one superficial foot has a diameter of 13.540534in. and a circumference of 42.538911614in. Its greatest girth is therefore 10.63473540in. The diameter squared is 183.346065, called by experts in timber measuring a "true" divisor; and the quarter-girth squared is 113.09759802801316, another true divisor, both looking very formidable, but not actually so, for in practice the decimals are all "shed."

STABLING AND FIVES COURT, WARLBECK, ILKLEY.

THIS building has lately been erected at Ilkley, under the superintendence of the architect, Mr. E. Brantwood Muff. The locally treated walling is of sandstone, from a quarry in the neighbourhood, a cavity being formed between it and an interior lining of bricks; in the stable salt-glazed ones have been used. The roof and the stable entrance archway are covered with tiles. A hayloft is formed over the bicycle and tool houses, the height necessary for the Eton Fives Court being obtained behind it. The contractor for the work was Mr. George Smith, of Ilkley. The vane, representing Pegasus, the door furniture, &c., were specially designed, and the drawing we illustrate was exhibited in the Royal Academy this year.

THE VENTILATION OF DWELLING-HOUSES.

By JOHN W. HAYWARD, M.D., late Vice-President of the Liverpool Architectural Society.

IT is not necessary to enlarge on the need of an abundant and continuous supply of fresh air in our houses, or on the necessity of a continuous removal of the vitiated air for comfort as well as health, because these are now fully admitted. It is only necessary to point out how these desiderata may be met without difficulty and at little cost.

A house has to serve two principal purposes—to live in during the day and to sleep in during the night. To be satisfactory, house ventilation must be adapted not to one only of these times, but to both. The means adopted for the purpose must also be adjustable to the different seasons of

the year—to the winter and summer, and spring and autumn; that is, the openings must be so under control as to be able to be enlarged or diminished according to the direction and velocity of the wind and the number of occupants of the house or room. In temperate and cold-temperate climates, the temperature of the incoming air must be so under control that it may be increased or diminished at will; that is, that it may be raised in cold weather, and lowered in hot weather.

Of the vast number of plans that have hitherto been suggested and tried, not one has proved entirely satisfactory. The reasons for this have, I think, been that they have been complicated, costly, and perhaps unsightly, and not adaptable to the varying circumstances. Architects and builders, and the public in general, have in consequence become afraid to listen to proposals for special house-ventilation, and have resigned themselves to submit to the primitive means of open windows.

Ideal house-ventilation is: (1) That none of the air within the house may be allowed to be respired or used more than once—never a second time or over again; that, having been once used, it shall be abstracted, and thrown back into the outer air, and be replaced with fresh direct from outside. (2) That fresh air shall be supplied in sufficient quantity to fully replace the air abstracted. (3) That this abstraction and supply shall be effected in such a manner that the occupants of the room will not feel the current or movement; that is, so as not to be felt as a draught. (4) That the temperature of the incoming air shall be so under control that it may be raised in cold weather and lowered in hot weather to any degree desired. (5) That the inlets and outlets shall be easily adjustable, by slides or valves. (6) That the provisions shall be such that the air may be allowed to pass through the house or rooms in quite a rush, or may be altogether arrested at will. And (7) That the whole house shall be included in the scheme, the lobbies as well as the rooms.

Such is ideal house-ventilation. Unfortunately, its provision is not free from complication, and it involves some expense—more of both, in fact, than most people care to incur. It is therefore seldom attempted, no other provision being made than for opening the windows; and it is erroneously supposed that on opening the windows at the top and bottom the air will come in at the bottom and go out at the top; but it will, under ordinary circumstances, come in at both, the two forming only one divided inlet. The inside air being less cold, and therefore less heavy, is pushed out of the room up the chimney, and into the lobby by the colder, and therefore heavier, air coming in through the window openings; and, unfortunately, that coming in through the upper openings tends to fall on to the heads of the occupants, and that coming in through the lower to pass to their feet. The consequence is that during use of rooms the windows are usually closed, and there is no ventilation at all, so that the rooms become hot and stuffy.

I admit that ideal ventilation is not practicable for ordinary houses; but I do not believe that a practicable scheme for ordinary houses is an impossibility. In formulating this, however, regard must be had to popular prejudice rather than to scientific perfection. The window openings, the doorways, and the chimneys must be used as the principal channels for the ingress and egress of the air. The two principal seasons of the year must be provided for—namely, winter and summer; and the two principal times of use of the living rooms—namely, when occupied and when not occupied; and of the bedrooms when the occupants are on the bed and when on the floor. In cold weather ingress by the doorway is to be preferred. In the living-rooms the inlet should be at, and only at, the top by 2in. or 3in. of the top of the door being fixed with hinges, to open inwards and be easily opened and shut. The opening of the door for entrances and exits will also let in much air from the lobby. Into the bedrooms the inlet should be at, and only at, the bottom, by 3in. or 4in. of the door being fixed with hinges, to open inwards and upwards, and be easy to open and shut. For egress the chimneys and crevices will have to be trusted to. In hot weather ingress by open windows is perhaps the best, or at any rate it may be utilised, again trusting to the chimneys and crevices for egress, when the room is occupied. The same provision must be made with the windows as with the doors. For the living-rooms a 2in. or 3in. opening, perhaps of coloured glass, across the whole or part of the top of the window should be fixed on hinges and be easy to open and shut. Perhaps of the window nearest the door it should be made to open inwards, and of that farthest away from the door to open outwards, in order if possible to determine the ingress and egress. For the bedrooms only the bottom of the window should be made usable for special inlet. The lobbies may be ventilated in the same way; but here the inlets should be larger, and if possible means should be provided for warming the air.

The localities indicated for the inlets and outlets are not only dictated by theoretical considerations, but are enforced by personal practical experience. The object in view in having in the living-rooms the inlet at the top of the window and door is that the incoming air may be directed, not straight on to the occupants, but upwards to above them, and be tempered by the warmth always present in the upper part when the room is occupied. In the case of the bedrooms it is altogether different; here the heavy cold air coming in at the top falls upon the occupants of the bed as a dangerous draught, whereas coming in at the bottom it falls to the floor and passes along it to rise up around the bed and replace the light warm air ascending from the occupant of the bed: during undressing and dressing the inlet may be closed, if necessary.

"THE ENGINEER IN SOUTH AFRICA."*

THE volume under the above title is a review of the industrial situation in South Africa after the war, and a forecast of the possibilities of the country. Mr. Stafford Ransome, M. Inst. C.E., special commissioner of the *Engineer* in South Africa, the author, was appointed by that journal at the close of the war to visit all the British possessions south of the Zambesi River, and to write frankly on the various problems which have been evolved by recent events. He was to be unhampered by any editorial point of view. The series of articles on "South Africa from an Engineer's Point of View" which appeared in the pages of our contemporary was the result. The author of the present volume has, by permission of the editor, availed himself of the material and suggestions of these articles, and though a large proportion of the matter has appeared in the columns of the *Engineer*, the present book is by no means a reprint, but rather a rearrangement of the substance of those articles. The author is right in thinking that the future success of British South Africa will largely depend on the engineering and industrial possibilities of the country, and that the book he has written should appeal to a larger class than that of the engineer. The earlier chapters are of a controversial character, and deal with the industrial geography, cost of living and travelling, politics and their bearing on the industrial question, the business "boom,"

labour question, intercolonial relations, &c. The latter portion of the book treats of the more important engineering industries as now carried on, and their possibilities. As Mr. Ransome observes, the late war has had the effect of effacing the commercial and industrial map of the country, as we know it; familiar landmarks have been partially obliterated, others have sprung up, and the present political boundaries will be of decreasing importance. "The South Africa of the future will be ruled not by the seaports, or even necessarily by the coastal colonies, as in the past, but by the great industrial centres. Up to the present the position of Johannesburg, Kimberley, and Rhodesia may be likened to that of the prisoners of the Fleet, whose gaolers could fix the price at which they delivered to them their food from the outside world. The coastal colonies have been those gaolers, and owing to the complications of Anglo-Dutch misrule, have been able to sweat and hamper the industries of the interior. . . . The growing strength of the industrial centres is slowly but surely undermining the political importance of Cape Colony." The author says the political tendency of Southern Cape Colony, the centre of all that is retrogressive and anti-British in South Africa, is towards parochialism and isolation. The alleged "boom" that was to take place as the result of peace is impossible, for a long time must elapse for the country to recover from the effects of a long war. The author confirms Lord Milner's forecast that it is Johannesburg that will some day develop into a city of several millions, and which will be the industrial capital of South Africa, and it is to that place that British industrialists should direct their attention. From an engineer's point of view, the centre of interest lies in the Transvaal, of which this city is the chief. Cape Town will, it is said, decrease in importance except as a port and depot. There are five routes to Johannesburg from the sea—(1) to Cape Town, over 1,000 miles; (2) to Port Elizabeth, southwards and westwards, 714 miles; (3) to East London, 660 miles; (4) to Durban, 483 miles; and (5) north to Pretoria, and then eastwards to Delagoa Bay, 396 miles. Of these five termini on the coast, Delagoa Bay is said to be the best natural harbour; the route from Cape Town is chiefly used for mails. Referring to the cost of living and travelling, many interesting figures are given worthy the attention of all those who contemplate going to South Africa. The author places the average hotel expenses of an ordinary commercial engineer at about £2 a day in the towns. In addition, club life must be reckoned as an average 10s. per day. Cab fares are about 10s. an hour in Johannesburg. A visitor in the large centres may put his daily cost at £2 15s. per day. As to the engineer, his hotel and club life will cost him not less than £2 per day; lodgings in Cape Town, Kimberley, and other large towns will range from £8 to £15 per month for bare board and lodging. In Johannesburg the cost of living would be about £30 to £40 per month at the least. The author gives a useful scale of the rates of the pound sterling in the more important districts, as follows:—

Natal and Coastal Cape Colony	12s. to 13 0
Central Cape Colony & Orange River Colony 10 0	
Transvaal and North Cape Colony	8 6
Southern Rhodesia	6 0

These figures show the value of a pound sterling as we know it in London for a man with a small salary—say £300 to £400 a year. The chapter on "The Prospects of Employment" is instructive. Wages vary much in different parts. In Natal they are higher than in Cape Colony near the coasts, in Kimberley and Northern Cape Colony they are still higher, in South Rhodesia highest of all. The author says the only male white labour wanted in South Africa just now is for the building, agricultural, and pastoral industries. Building trade hands on Coastal Cape Colony, provided they are skilled and steady, can easily find employment at from 10s. to 12s. 6d. a day, exclusive of overtime. The average normal week is from 48 to 51 hours. "The amount of building and construction work which is going on now, and which is daily increasing, makes it a practical certainty that any artisan in this line may reckon on securing work with but little delay after arrival which will bring him in at least £3 per week." The wages of skilled mechanics are about the same, though the artisan engineer is not wanted just now in great numbers. A fitter,

pattern-maker, or smith in England, who is skilled and steady, can obtain at least 32s. to 36s. a week; "but in Cape Town he will find living nearly twice as costly as in London, and less comfortable. . . . His bare board and lodging will cost him from 25s. to 30s. a week, and it will be bad at that just now." For the engineering artisan who has to find lodgings and live as best he can until he has made a settled home £3 a week will not go so far as 35s. in London, or as 25s. in some of the less expensive engineering centres in Great Britain. For married men the prospect is less encouraging if he transmits half his earnings to his family at home. The author says large numbers of professional engineers have come out to South Africa since the war, and he is hopeful as to the prospects for engineers, though there is a good supply of practical mining and railway engineers on the spot. The chapter on "The Labour Question" is instructive, and many of the problems are discussed. Mr. Ransome shows up the pernicious "catch phrase" of British writers who say that South Africa is "a white man's country." He shows that it is impossible to plant British unskilled labour all over the country, for if we should force such a measure upon the country every loyal British employer of labour would be transformed into a Dutchman. Mining is, of course, the staple industry, and without it South Africa would be valueless. In the chapter on "Struggle for Life in Rhodesia" the author gives the following idea of the price of labour in monthly salaries and wages, which are very tempting, but must be discounted by the high cost of living we have noticed. Thus bookkeepers obtain £30 per month, blacksmiths £35, clerks £22 10s., domestic servants from £5 to £15, gangers £15, gardeners £15, mine managers £75, printers £30, prospectors £30, shop assistants £20, stonecutters £32 10s. Daily wages: Bricklayers 30s., brickmakers 15s., carpenters 25s., engine-drivers 25s., fitters 30s., masons 32s. 6d., miners 25s., painters 25s., plumbers 25s., &c. The white artisan stands a good chance of employment now; but the cost of living and waiting requires that he should have about £40 to £50 after landing in Cape Town. We cannot refer to the other chapters on the possibilities in the Orange River Colony, a business policy for manufacturers, the theory and practice of railways, harbours, Durban harbour, diamond-mining in Kimberley, treatment of gold ore, well-boring, irrigation, and other descriptive chapters on engineering industries as carried on, and their prospects. Many useful suggestions are made. In dealing with the policy of manufacturers, the author thinks that it is far the best method for a number of firms whose interests do not clash to amalgamate for purposes in South Africa. The book is interesting and instructive, and ought to be read by every engineer, artisan, and manufacturer who is contemplating going out to South Africa. The work is illustrated.

"THE ARCHITECTURE OF BUSINESS BUILDINGS."

MR. J. W. BEAUMONT, President of the Manchester Society of Architects, gave his address on Thursday evening in last week at a special meeting in the Boardroom of the Chamber of Commerce, Mosley-street, Manchester. He looked forward, he said, to the time when architectural societies may become so important in large towns that they may be consulted by the public authorities in cases of proposed improvements or new streets to be formed in those towns.

DESIGN IN STREET ARCHITECTURE.

It will never, he admitted, be possible for a public body to say that the buildings in an important street shall all be carved out of a certain design, nor that a certain architect shall be appointed to carry out all the buildings in such a street; nor would this be desirable. Variety of street architecture is, to his mind, much better than uniformity. Generally, each building had its own use, and should by its architecture express the purpose for which it was erected. It would be absurd to confine the elevation of a street to one architectural design, where one building may be used as shop premises, another as a set of offices or chambers, and another as a warehouse. But it would be held that some control should be exercised to see that proper and suitable heights are maintained and that materials are used in the various buildings that will harmonise with neigh-

* The *Engineer* in South Africa. By STAFFORD RANSOME, M. Inst. C.E. Westminster: Archibald Constable and Co., Ltd., Whitehall-gardens.

bouring edifices. One thing he wished to impress on his hearers was that more control should be exercised by public bodies in seeing that all new buildings are erected in such a manner as to minimise the risk of fire.

THE REGISTRATION QUESTION.

Several subjects of great importance had received a large amount of attention during the last twelve months, and the greatest of these was the question of the statutory registration of qualified architects. The time is at hand, Mr. Beaumont thinks, when architects must make up their minds on this question. In order to ascertain the general feeling on the subject he had invited the opinion of various societies in different parts of the country, and out of twelve from which he had received replies, six were in favour of registration, one against, two were divided in opinion, and three had not discussed the question. The Manchester Society had already pronounced in favour of registration. Of course, as was the case in other professions, no form of registration would suffice to suppress "quacks," but it would enable the public to discriminate between qualified and unqualified architects. It would also be an advantage to a man to employ an architect who was legally qualified, and against whom he would have legal redress in case of neglect or incompetence.

OUR SCHOOL OF ARCHITECTURE.

As to education, Mr. Beaumont said it was important that architectural students should pass all the examinations of the Royal Institute of British Architects, and not simply the first and second. In this connection, he referred to the establishment of a School of Architecture in Manchester. He was glad that this school had been established. The time of apprenticeship might perhaps be shortened for those who had passed through the school, but nothing in the shape of theoretical or academic training would enable a student to dispense with the practical training of an architect's office. He believed that this Manchester School of Architecture will become, under the care of Mr. S. H. Capper, one of the foremost centres in the kingdom for the instruction of architectural students. Turning to the question of competitions, Mr. Beaumont suggested that the principle had been overdone. He recognised the value and need of competitions in the case of public buildings, but in all cases they should be conducted on an equitable basis. He indicated certain ways in which a useful reform in regard to competitions might be brought about.

Mr. Alfred Darbyshire (who has filled the office of president for the past two years) moved a vote of thanks to the President for his address.

Mr. S. Henbest Capper (of the School of Architecture), in seconding the motion, gave the result of his experience of the working of a registration law in the province of Quebec. Whilst he was at the head of the School of Architecture in that province, Architecture was made a close profession in the same sense as the Bar and Medicine are close professions. Some of the results were not exactly what one would wish. One of the immediate results was to flood the profession with unqualified men, because every person who had had a sign-plate with the word "architect" upon it had to be admitted as a qualified architect. Of course time would cure such an evil. With regard to the School of Architecture, here in Manchester he fully appreciated the necessity of practical training. He suggested, however, that arrangements might be made whereby students, in some cases, might carry on their collegiate training side by side with their practical work.

THE MODERN SKETCH CLUB.

THE second exhibition of the Modern Sketch Club, opened to the public at The Modern Art Gallery, 175, Bond-street, last Saturday, contains many interesting sketches by members of the Langham, the London, the Dublin, the Scottish, and other sketching clubs. We can only notice in a brief glance at the exhibition, Albert Ludovici's bright figure subjects and London sketches—a coquettish young lady with fair hair in evening dress, near whom sits a young man, entitled "What Shall We Do?" his "Apsley House," a sketch of Hyde Park Corner on a dark evening (31), and "Rotten Row" (45), &c. Percy French sends a sketch in Hyde Park, showing the fine pink blossom of the rhododendrons, and "A View in Connemara" (60). Hugh Rudy (15) has a landscape "A Grey

Day," bold and crisp in the foliage. H. Moxon Cook, "Cottages, Achill Island," is vigorous. Miss Sophie D'Ouseley sends one or two architectural sketches of interest, "Lord Leicester's Hospital, Warwick" (18), and "Christ Church Cathedral, Oxford" (24). Miss E. Jex-Blake is, as usual, happy in her firm, crisp sketches of morning and evening effects on the River (19, 32). Hal Hurst sends three subjects, "Paris Plage" (17), "Molly" (73), "The Old, Old Story" (103), full of character and power, and Stanley S. Young gives us a clever sketch of a young girl in chair, in a pensive mood (43). There is a sketch, also, by the late Phil May, "At Eventide," that will possess interest. Richard B. Hunter has a skilfully composed subject, "The Spell," a weird witch scene in a forest, and R. Stone's figure subject, "The Quarrel," a lady in white with black hat, leaving a room, is decidedly good in attitude and drawing. Geo. C. Haité's subjects have always a charm, his market scene, "Tangiers" (62), is a wonderful study of strong sunlight, and a crowd of figures full of vigour and rich colour. His "Old Timber," is a delightful study of woodland in mellow tones of brown and green. Cecil W. Quinell sends two delightful studies of girls. "Sybil" (55) is a fair, auburn-haired girl, with sweetly expressive eyes; and "Marie" (123) a study of a girl's head, in large, white tulle hat, very graceful. James Aylward, in "The Lost Letter" (68), draws a girl reading a letter by a cottage fire. There are works also by Edward Slocombe (109), T. W. Holgate (118), Alfred E. Lewis (99), Geo. C. Haité (124), John Whipple (143), Miss Millicent S. Gore, Val Davis (180), Sylvester Stannard, Bingham McGuinness (184), A. Simpson (152), Champion Jones (165), which show decided skill in drawing and firmness of handling.

THE RESPONSIBILITIES OF THE MUNICIPAL ENGINEER.

THE opening meeting of the Yorkshire College Engineering Society was held on Monday night at the College, Leeds, when Mr. E. J. Silcock, M.I.C.E., delivered the President's address. Mr. Silcock said he had been present at the birth of the society, and now was called upon to preside over its meetings. He believed he was the only old student of the college who had ever occupied the position of President. He proposed to speak to them on the subject of municipal engineering. The importance of this department of the civil engineer's profession was too often overlooked, and it was only of late years that the corporations of the country had realised that, in order to secure the services of first-class engineers to direct their engineering works, they must appoint men who had been specially trained, and must pay them adequate salaries. The municipal engineer had, probably, a greater influence on the health and well-being of the inhabitants of the town which he served than any other individual in that town. In addition to the control of the conditions of health in a city or town, the engineer had to direct the policy of the Corporations in dealing with vast sums of money. Only men who possessed a thorough knowledge of engineering principles, coupled with sound judgment and the capacity to take a broad view of the development of a city, could be trusted to deal with interests of the magnitude which every day confronted the municipal engineer. During a recent session of the society, said Mr. Silcock, he had read a paper descriptive of the new waterworks in connection with the extension of the water supply of Leeds. These works involved the construction of four immense reservoirs, formed by damming up the valleys of the Burn and Laver, together with the conduits necessary for conveying the water to Leeds. These works extended over a length of 46 miles, and the expenditure would amount to over two millions sterling. Another example of municipal engineering in Leeds was the electric tramway system. Both these gigantic undertakings were designed and executed by the municipal engineer. In the larger cities the work of Corporations had become so great that it was more than one man could accomplish, and the work had to be subdivided into departments. But in every case the Corporation looked to the engineer-in-chief to guide them in all new departures of big undertakings. Mr. Silcock went on to speak of bridges, and remarked, as to the necessity for sound building, that it was not an uncommon thing in Leeds to have loads of 75 tons pass along the roads upon four wheels.

Sewerage systems, purification systems, the application of sewage to land, water supply, the acquisition of gathering grounds, street improvements, the prevention of floods, tramways, light railways, electric lighting, gas works, destructors, and architectural work were all referred to and enlarged upon as forming part of the duties devolving upon the municipal engineer. In conclusion, Mr. Silcock urged that in spite of drawbacks in connection with having to deal with changing public bodies, municipal engineering offered good openings to those well up in their profession.

REGISTRATION OF TITLE.*

By J. S. RUBINSTEIN, London.

UNDER the Bankruptcy Act of 1883 the administration of estates in bankruptcy was brought under the jurisdiction of the Board of Trade. The burden of officialdom thus imposed on bankrupt estates is notorious. In the case of the insolvency of a person, creditors will, as a rule, accept almost any terms rather than have the estate wound up in bankruptcy—indeed, the most potent argument used to induce creditors to accept a composition is to assure them that if the offer made is refused the estate will have to go into bankruptcy. I will not, however, now pursue the inquiry into the operation of officialdom in bankruptcy, as our time can be more usefully employed in considering a threatened extension of its operation in another direction, where it would take effect in innumerable daily transactions in every county in the kingdom, involving an outlay of many millions. I refer to the extension of officialdom that has already resulted, and is still further intended to result, from the passing of the Land Transfer Act, 1897. The history of registration of title in this country stated shortly will, perhaps, best explain the grave position in which we stand. Registration of title was first established in this country in the year 1862. This Act was followed by an Amending Act in 1875. Under one of these Acts it was, and it is to-day, open to every property owner in the kingdom to register his title. The Acts proved, in fact, dismal failures. Owners discovered by experience that the absolute titles they obtained created new and unlooked-for difficulties in dealing with property. Every conveyancing expert came to recognise that the system was wholly unworkable, notably Lord Cairns, the author of the 1875 Act, and who subsequently set himself to work to reform the old system, and succeeded far beyond expectations in effecting this object by his Acts of 1881. The system of registration being discredited and abandoned by every expert, it would appear incredible that a people who pride themselves on being above everything practical should have consented to the passing of the Act of 1897, whereby the system of registration of title has been brought back to life, and actually made compulsory. Shortly, the explanation of this phenomenon can, I believe, be summarised as follows:—(1) The Act of 1862 brought certain officials into existence, and officials, once created, attach themselves so tenaciously to the public purse, that the task of dislodging them becomes superhuman. (2) Legal matters being outside the ken of the average layman, it is customary to accept on trust any measure affecting legal changes which the Lord Chancellor for the time being brings forward. His authority on law questions is supreme, and for obvious reasons cannot well be questioned by the legal profession. Solicitors in this connection, I should add, do not count, as their influence with the authorities is practically nil. (3) The present Lord Chancellor was appointed to that office in 1886, an office which he has since held, except between the years 1892 and 1895, when a Liberal Government was in power. Unfortunately, he never had any conveyancing experience, and a knowledge of conveyancing does not come by intuition, even to Lord Chancellors. On the other hand, he must be credited with a profound and unbounded faith in officialdom. Commencing with the year 1887, he brought in almost yearly Bills to make registration of title compulsory all over the kingdom. By dint of perseverance, and by means of extreme pressure most skilfully applied, he ultimately succeeded, in 1897, in inducing the opponents to fall in with a so-called compromise, whereby the opposition to his Bill was withdrawn

* From a paper entitled, "The Blight of Officialdom," read Oct. 14 before the Law Society at Liverpool.

on the representation that the system of compulsory registration of title would only be tried in one county as an experiment for three years. Having obtained the Act, the authorities apparently recognised that the system of officialdom could be most easily fastened on to London. The necessary consent of the London County Council having been obtained, the Act first came into operation in certain parishes in London on Jan. 1, 1899, and it was subsequently extended gradually to the whole of the county, the City of London coming last under the Act on July 1, 1902. In the sessions of 1900, when one year only of the experimental period had run off, the Government brought in a Bill to expend £265,000 of public money in purchasing extensive property in Lincoln's Inn, in order to erect a permanent Registry office. In these days, when millions are voted away in a few hours, Parliament cannot be expected to trouble about such a trifle as £265,000, so the Bill passed without a word of objection. The authorities were, however, good enough to intimate that in erecting the office there was not the slightest intention of departing from the understanding arrived at when the 1897 Act was passed. The experimental period of three years came to an end in December, 1902, and most strenuous efforts have since been made to induce the authorities to hold the inquiry into the working of the system that Parliament was led to believe would follow the trial of the system. The authorities, however, now scout the idea of an inquiry. Plain people may well ask what possible object can there be on the part of the Government in evading an inquiry if the new system were really intended to benefit the public. The system is either good or bad. If it is good, an inquiry might be trusted to bring out this fact, with the result that the system could then be confidently extended all over the country. If, on the other hand, it is bad, the sooner the system is ended the better it will be for the public. Why, then, does the Government shrink with such manifest terror from an inquiry which would bring this question to the test? Surely a system which is so weak that its sponsors will not allow it to be investigated for fear it may fall to pieces stands self-condemned. The facts in connection with the inception and working of the Registration Acts cannot be too urgently or too often brought under notice. At former meetings—at Birmingham in 1897, at Weymouth in 1890, at Oxford in 1901, and also at the Building Societies Congress held at Cheltenham in 1902—I have read papers wherein I have explained that the conditions in this country, particularly in view of the freedom allowed to property owners to tie up or deal with their property in any way they please—conditions wholly different to those existing in our Colonies, for instance—make it practically impossible to introduce a registration system sufficiently elastic to be a workable one. I have also dealt in detail with the working of the new system of compulsory registration of title, and have shown how it added grievously to expense, greatly increased delay, opened a wide door for fraud, and tended generally to throw conveyancing into a state of utter chaos. I will therefore content myself now with giving only the barest outline of the system. The new system is at present in operation in only one county in England—the County of London—and it cannot be denied that it has added most seriously to the difficulty, delay, risk, and expense of property dealings in London. In small transactions—£90 to £1,000—the increase in the expenses ranges from 24 to 41 per cent. Some idea of the extent to which business is hampered may be gathered from the fact that the Methodists found the system so onerous that they took steps recently to promote a Private Act to exempt their property from the Act of 1897, and they only refrained on the Lord Chancellor finding it expedient to relax in their favour the provisions of which they complained. Three sorts of title can be registered:—(1) Possessory, (2) Qualified, (3) Absolute. The following table will, however, show that in practice only possessory titles—a character of title which has not a counterpart in any country in the world—have hitherto been registered.

From the first I have argued that the registration of possessory titles was a delusion and a sham. As we do not live in an age of miracles, it was impossible for me to conceive how a system that broke down utterly when tried as a permissive one under the Acts of 1862 and 1875 could become a successful one simply by being made com-

Year.	Freehold.			Leaschold.			Total.
	Absol-ute.	Quali-fied.	Pos-sessory	Absol-ute.	Quali-fied.	Pos-sessory	
1869	15	—	894	1	—	2,131	2,954
1900	21	—	2,564	—	7	8,774	11,366
1901	20	—	3,770	—	2	12,285	16,077
1902	15	—	3,982	1	—	11,861	15,839
—	74	—	11,100	2	9	35,651	46,236

pulsory under the Act of 1897. To prove that my view was the right one, it will be sufficient for me to quote Mr. Brickdale, the registrar himself, who at the Building Societies Congress said:—"Then with regard to the possessory title not taking any account of prior encumbrances, a certain amount of capital has been made against the Act sometimes on that account. It is said, Why do you allow a man to pose as the owner of an unencumbered fee simple when really there is a huge mortgage in existence, or when really there is a lease, perhaps at a very high premium, which takes away half the value of his property from him? Well, if you are going in for the system of possessory registration at all, it is far better, it seems to me—I am only defending what others have done—it is a far better plan to have it quite understood that the possessory certificate not only is not to be relied upon for anything prior to the registration, but that it entirely ignores it, and that people must look outside for all encumbrances prior; and that is why no mention either of restrictive covenants, or of mortgages, or of leases (as a rule) prior to the registration is entered on the possessory certificate. These are all matters which are dealt with outside the register, and will be shown by the abstract of title which the owner will have to keep until such moment arrives as he thinks he may as well try for an absolute title and get it settled for good. In a matter of this sort you cannot register half in one form and half in another. If we take to mentioning any of these things people would begin to think they may rely upon us for all of them, and I think the rules are perfectly right in saying that we are not to mention encumbrances at all." In the above extract the words I have italicised make it clear that a possessory title will not grow into an absolute one, and that the latter will have to be obtained quite independently, and yet in what terms can we speak of the registry office that continues to this day to tell the world that the registration of possessory titles is of real value? Notwithstanding Mr. Brickdale's frank admission that the possessory titles which are now being registered cannot mature, and that they are, therefore, practically valueless, that system of registration goes on merrily, some 400 of such titles being registered weekly, a heavy toll being levied on all transactions to pay for the music. The officials have, however, felt the force of the hostile criticism which has been levied on all sides against the new practice, and they have been for some time past at their wits' ends to devise a scheme which would serve as a pretext for continuing their official existence. In this they are simply obeying the instincts of self-preservation. Holding practically any number of blank cheques on the Exchequer, they will not recognise that there is such a word as failure. They may consequently be depended upon to go on for all time trying one experiment after another, the interests of the public being wholly absent from their thoughts. A scheme has at last been evolved which the authorities no doubt fondly hope will prevent them hearing the hated word "inquiry" for many years. Under the Land Transfer Acts the Lord Chancellor is empowered to make rules with the advice and assistance of the Rule Committee. The Rule Committee under the Acts consists of the registrar (Mr. Brickdale), a Chancery Judge (Mr. Justice Kekewich), and the nominees of the General Council of the Bar (Sir Howard Elphinstone), the Board of Agriculture (Mr. J. W. Clark), and the council of the Law Society (Mr. W. Melmoth Walters). Mr. Brickdale advocated that a possessory title registered upon a sale under ordinary conditions completed by entry into possession should be turned into an absolute title after the lapse of two years. The other members of the committee are stated to have decided to alter the initial period from two to twelve years; but this decision was overruled by the Lord Chancellor, who, on his own initiative, has, in

the draft rules which have recently been issued, fixed the period at six years. According to the Act, the Lord Chancellor is to make the rules "with the advice and assistance" of the committee. The Lord Chancellor's reading of the Act is "with or against the advice" of the committee. What it is to be a Lord Chancellor! If it is realised that every conveyance brought at the present time into the registry is without publicity registered as a matter of course, and without any inquiry as to the title of the person who purported to grant the conveyance, and without noticing on the title the existence of a mortgage lease or other encumbrance, you can obtain perhaps some slight conception of the danger that will follow if a title so registered is in six years to be turned into an "absolute" one, carrying with it a State guarantee. The new proposal will not bear the slightest scrutiny. The fact being admitted that for practical purposes a possessory title is valueless, it is clear that the earlier title must be investigated before an absolute title can be issued. A postponement of six years from the date of registration of a possessory title does not obviously lessen in any way the necessity for, or simplify the investigation of, the earlier title.

The officials are on the horns of a dilemma. If they investigate the titles properly, their work will be so great that they will be unable to cope with it, even if twenty additional registry offices, each employing their 200 officials, are provided. The expense also will be enormous; and must be provided from some source; but this is a matter which does not trouble the authorities. If the officials dispense with investigation, or investigate to a limited extent only, everyone possessing the slightest practical knowledge of the subject will recognise the extreme danger of bad titles being registered as absolute ones, and can only wildly guess at the extent to which this procedure will involve individuals in ruinous litigation and the State in incalculable liabilities. It is amazing and humiliating to think that without any further sanction from Parliament a rule can be formulated at the instance of one individual, without having himself any practical knowledge of the subject, and against the advice of all his independent expert advisers, which may have the effect of involving the country hereafter in liabilities that may extend into millions. Verily it is true that officialdom cares not what number of houses it burns down so long as it provides a sufficient quantity of roast pig for itself! The question that naturally arises is whether some relief cannot be obtained from Parliament. I, however, fear it is far too obvious that to rely upon Parliament is to rely upon a broken reed. The difficulty of getting any measure through Parliament is immense; but once a measure is passed, the difficulty of getting Parliament to reconsider the matter is practically insurmountable. The circumstances under which the Act was passed in 1897 would lead one to imagine that Parliament, jealous as it should be that every minister should loyally carry out every understanding come to, would have insisted upon the inquiry after the experimental period of three years had elapsed; but Parliament has rarely a moment to spare for a subject, like the one under consideration, that is not a party question. As a matter of fact, a discussion was raised in Parliament in May last on the Land Registry Vote. It is worth while giving a short consideration to the discussion, as it throws a strong sidelight upon the methods by which we are governed, and shows what great tacticians our rulers are, and doubtless later on we will be told that the division that took place expressed the deliberate view of Parliament that no inquiry into the system was required.

Under the auspices of the Newcastle-upon-Tyne and District Clerk of Works and Builders' Foremen Association, on the 7th inst., Mr. D. S. Jones, of the firm of Messrs. Jones and Maxwell, Pelaw, lectured at the Collingwood Restaurant, Newcastle, on "Bricks and their Manufacture."

The work of reconstructing the town-hall at Birkenhead, which was recently severely damaged by fire, is actively progressing, and on Thursday in last week the cupola on the tower was successfully hoisted into position.

The Federal House of Representatives, by an exhaustive ballot, have selected Tumut, near the Murray river, New South Wales, as the Federal capital for Australia. The New South Wales members were in favour of Lyndhurst, which is only 100 miles from Sydney. The House decided that the Federal territory attached to the new capital should consist of 1,000 square miles.

OBITUARY.

MR. HENRY MARC BRUNEL, M.I.C.E., who died on the 7th inst., aged 61 years, was the second son of I. K. Brunel, the engineer. Although only 17 when his father died, he took a personal part in some of the later engineering works, notably in the launch of the *Great Eastern*. He was educated at Harrow and at King's College, London, and served a premium apprenticeship. Before his active entry into professional life he was engaged for some years with his brother, the late Dr. Isambard Brunel, in compiling the life of their father. He entered in the seventies into partnership with Mr. (now Sir John) Wolfe Barry, and was largely associated in the important work of Barry Dock, the railway bridge over the Thames at Blackfriars, and the bridge recently erected at Connel Ferry, as also with the Tower Bridge. In the autumn of 1901 he had a slight apoplectic stroke, followed a few months later by the bursting of a blood-vessel in the brain, from the effect of which he never fully recovered.

CHIPS.

Memorial-stones in connection with the Salvation Army's new citadel in Main-street, in the Anderston district of Glasgow, were laid on Saturday. The cost of the building is estimated at £4,600.

The First Presbyterian Church at Armagh was reopened last week after renovation and decoration, carried out at a cost of £600 by Mr. James Maxwell, of Armagh.

The new wing and hospital which have been added to the fine buildings housing the Manchester and Warehousemen and Clerks' Orphan Schools, at Cheadle Hulme, were declared open on Saturday. By the generosity of the trustees of the late Mr. Manasseh Gledhill a sum of £7,500 was recently contributed to the institution for the additions. The new wing, so provided, affords additional space for 70 beds in the girls' dormitory, and a considerable enlargement of their recreation-room, while the new hospital contains 30 beds in the infectious and 20 beds in the non-infectious departments. The architects were Messrs. W. and G. Higginbottom, Manchester, the contract being carried out by Messrs. Burgess and Galt, builders, Ardwick, at a cost of £7,500.

The electrical committee of the Manchester Corporation have received and accepted a tender of resignation from Mr. G. F. Metzger, their electrical engineer, arising out of a misunderstanding as to the terms of agreement.

The opening meeting for the present (the eighth) session of the Glasgow Architectural Craftsmen's Society was held on Friday evening at 204, George-street, Glasgow, when an inaugural address was delivered by Mr. Ernest Monro, A.R.I.B.A., who selected as his topic the demands of construction.

On Wednesday week the new public library and reading-rooms, erected at a cost of £5,000 on the New-road (East-end), Chatham, were opened. Mr. Carnegie has given £4,500 towards the cost of the new buildings. Mr. Bond was the architect, and Messrs. West Bros. were the builders. These were also the architect and builders of the town-hall of the borough.

The third and last of the new schools erected under the Hugh Henry Boyd endowment scheme was opened on the 1st inst. in Roden-street, Belfast. The main schoolroom is 40ft. by 24ft., with the ceiling open to the ridge. The room is lighted by large windows on either side. A classroom 17ft. by 16ft. is entered from a passage, and is fitted up with a gallery. The building is erected in perforated brick, and the upper portion is rough-dashed. The work has been carried out by Messrs. MacIvor Bros., from plans and under the superintendence of the architects, Messrs. Young and Mackenzie, also of Belfast.

The Princess Louise (Duchess of Argyll) has consented to visit Croydon, for the purpose of unveiling the statue of the late Queen Victoria, which will occupy a prominent position in the centre of the town. The date of the ceremony is towards the end of the month.

The Governors of King's College Hospital held a special meeting on Monday, at which, after considerable discussion, a resolution was adopted in favour of removing the institution to South London. An Act of Parliament will have to be obtained authorising the removal, and the committee were authorised to apply for the necessary powers, and to take steps to secure a new site. Professor McHardy suggested that in the new hospital they ought to have accommodation for 600 beds without cramping. He mentioned that he had in his possession offers of three different sites in South London varying in extent from 11 to 20 acres, which could be procured at from £3,000 to £4,000 per acre.

Building Intelligence.

CHRISTCHURCH, HANTS.—On Wednesday week the Earl of Northbrook, G.C.S.I. (Lord Lieutenant of Hampshire and chairman of the Education Committee of the County Council) opened a new technical school at Christchurch, which has been erected as a Queen Victoria memorial. The building is in the form of an extension of the town hall, and consists on the ground floor of two large rooms for technical instruction, and a smaller room for cookery classes. There is also an office for the surveyor and other rooms. On the first floor there is a large art-room, 31ft. by 18ft., and a class-room 22ft. 3in. by 12ft., with an art master's-room adjoining. The building is of Bridgwater bricks, with Bath stone facings, and is 5ft. higher than the town hall. The designs were by Mr. E. J. Legg, borough surveyor, and the contractor was Mr. F. Jenkins. The cost has been £1,410 apart from interior fittings, &c.

ECCLESHALL, SHEFFIELD.—The foundation-stone of the new cottage homes, which are being built for the Eccleshall Board of Guardians, was laid on Friday. The homes are being built on the moorland in Bole Hill-lane, Redmires-road. The site is at an altitude of 950ft. above the sea level. Accommodation is provided, to commence with, for 78 children, six boys and six girls to live in each house. The houses are arranged in two lines with a wide space laid out as gardens between them. Each semi-detached house, of which there are six, will contain a living-room or kitchen, 18ft. 6in. by 15ft., scullery 13ft. by 11ft., bathroom and lavatory, grocery, larder, clothes stores, and hall on the ground floor, and on the first floor there will be two dormitories, one for boys and one for girls, each containing six single beds and mother's bedroom. An isolation or spare bedroom is provided in each house. Each cottage has self-contained out-building and offices. There will also be a detached isolation block. The superintendent's house is near the main entrance from Bole Hill-lane, and will contain the committee-room. On the right and left of this house will be two stores 42ft. by 17ft. Stables are also provided, and a water-tower to supply the homes from the Sheffield town water. The site has been laid out and the plans prepared by Messrs. Holmes and Watson, architects, Sheffield, and the contract let to Messrs. Wilkinson and Sons, Guernsey-road, Sheffield. The amount of the contract is £16,000.

EDINBURGH UNIVERSITY.—During the summer a number of improvements have been made on the equipment of the University, designed to keep it abreast of the day as one of the great teaching institutions of the country. The departments dealt with have been the library, in the old university, and the chemistry, pathological, and anatomy rooms, in the new university. Competing designs were submitted for utilising the present space in the library, so that there could be got into it shelving not only for the 230,000 volumes of which the library consists at present, but for another 400,000 volumes. The one finally selected is by the Art Metal Construction Co., of Jamestown, New York. A contract has been taken by this company to fit up four rooms with their improved library standards and shelvings, and at present an installation of one room has nearly been finished. This apartment is 23ft. 6in. by 22ft. 6in. by 20ft. high, and under the new arrangements it will be made to hold about 45,000 volumes. It has been divided into two stories, the lower 8ft. high and the upper 12ft., with a glass flooring between them, and the electric light has been hung from the roof between the bookshelves. The standards and shelves are made of rolled steel plate $\frac{1}{4}$ in. in thickness. The faces of the standards are rounded, and these and the sides have insertions cut in parallel lines at intervals of an inch to receive the shelves, which are also of the same material. The space that would have been taken up by the heavy wooden frames is thereby saved. At the chemistry laboratories a new hall, 52ft. by 45ft. and 18ft. in height, has been provided, and another hall, 42ft. by 39ft., has been added to the pathology department. These and other improvements have been carried out from designs by and under the supervision of Mr. Allan E. L. Clark, clerk of works at the university, with the exception of the extension of the pathological department, the plans for which were prepared last year by Sir Rowand Anderson.

NEWCASTLE-ON-TYNE.—A group of car-sheds has been built at Wingrove for the Newcastle Corporation. The sheds were designed by Mr. A. E. le Rossignol, engineer and manager of the tramways, and the work has been carried out under the direction of Mr. Alfred Oxley, building superintendent of the Tramways Department, with Mr. R. B. Richley as clerk of works. The contract is being fulfilled by Mr. William Worley, jun. The shed is 340ft. long, and it has a temporary end towards the north, so that extension may be readily made upon ground that already is the property of the corporation, if, or rather when, the necessity should arise. The length of the building runs from south to north, with the opening into Westgate-road. It is parallel with Wingrove-avenue. There are two spans, each 37ft. wide, with a row of 27 hollow cast-iron columns between. The average height is about 25ft. There are to be six tracks, so that it will be seen, by a simple arithmetical calculation, that there will be accommodation for sixty-eight 30ft. cars, or for about fifty of the larger type. The shed is constructed throughout of steel, wrought iron, and concrete, and it is stated that the materials are all of British provision. The metal work comes from Messrs. Swinney Bros., of Morpeth, and there is, in the whole building, nearly a hundred tons of it. The concrete is mixed at the place by an automatic process. The roof, which has 54 wrought-iron principals, is supported on concrete walls, with steel stanchions at intervals; the adhesive quality of the concrete being increased by an iron interlacing. Concrete pilasters are built round the stanchions. Wooden shutters are placed from stanchion to stanchion, inclosing a space between, and into this space the concrete is poured, making a homogeneous wall. The concrete used is a four-to-one mixture.

PERRY BARR, BIRMINGHAM.—The Birmingham Crematorium was formally declared open by Sir Henry Thompson on Thursday in last week. It is situated at Sheldon Coppice, near Rokeby Lane, three and a half miles from the centre of the city on the main road to Walsall, and is of ecclesiastical character, carried out in brick and stone, with tiled roofs. It stands in the centre of grounds laid out with trees, turf, and shrubs. The size of the chapel itself is 50ft. long by 25ft. wide, and about 40ft. high to the ridge, with an open-timbered roof, the total length of the building being about 107ft. On one side there is a vestry and registry office with a separate entrance, and on the other side a small mortuary chamber. The chapel is principally lighted by lofty clerestory windows, and underneath these on both sides are recesses for the reception of cinerary urns. The catafalque is against the end wall opposite the entrance, and stands on a stone platform approached by two stone steps, and immediately beyond the catafalque are the iron doors leading to the ante-chamber between it and the furnace, the level of which is the same as the catafalque. After the committal service, the coffin is noiselessly removed from the catafalque by invisible mechanical means on to a carriage, from which it is passed to the furnace, which is a regenerative gas furnace. The apparatus consists of two portions, one in which ordinary coal-gas is produced, and the other the incinerating chamber, where the gas is burned with an admixture of air to complete the cremation. The air is forced into the chamber by blowers, through a series of heating tubes, in which it is raised to a high temperature by the waste heat from the incinerating chamber. The ashes, untouched by human hands, are removed through a small aperture into the urn placed to receive them. The steam for working the blowers is produced from a tubular boiler of sufficient capacity to permit of the working of a second cremating furnace should it be found desirable to add one in the future. The total cost of the crematorium, including land, chapel, furnaces, and lodge, has been about £6,000. Mr. Frank B. Osborn, F.R.I.B.A., Bennett's Hill, Birmingham, was the architect, and Messrs. Wilcox and Raikes, of Temple-row, Birmingham, were the engineers. The contractors were Messrs. John Barrsley and Sons, of Ryland-street, Birmingham, and Mr. Thorniloe was the clerk of works. The outlay has been £6,000.

The Board of Education have received a communication from the Foreign Office intimating that an International Fine Art and Horticultural Exhibition is to be opened at Düsseldorf on May 1, 1904. A hope is expressed that England will contribute largely to this exhibition.

PROFESSIONAL AND TRADE SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—The Council of the Institution of Civil Engineers have, in addition to the medals and prizes given for communications discussed at the meetings of the Institution in the last session, made the following awards in respect of other papers dealt with in 1902-3:—A Telford Gold Medal to George Deuchars (London); Crampton Prizes to A. B. Brady (Brisbane) and G. Maxwell Lawford (London); Telford Premiums to T. Johnstone Bourne (Tientsin), R. H. Rhind (London), H. T. Hinks (Marikuppam), G. A. Hobbler (Cairns), A. J. Goldsmith (Brisbane), F. H. Frere (Derby), R. Appleyard (London), P. Hamilton, B.Sc. (London). For Students' Papers the awards are:—The "James Forrest" Medal and a Miller Prize to Wanda Thompson (Burton-on-Trent); the "James Prescott Joule" Medal and a Miller Prize to I. V. Robinson (West Hartlepool); Miller Prizes to H. A. Bartlett (London), J. D. Morgan (Glasgow), H. S. Watson (London), J. V. Thomas (Gloucester), O. B. Rattenbury (Doncaster), and C. M. Skinner (Newcastle-on-Tyne).

THE LAND AGENTS' SOCIETY.—The annual meeting of the Land Agents' Society was held in London on Friday. Col. Halifax Wyatt, the president, occupied the chair. The meeting was well attended, and several important subjects relating to the management of the society were discussed. The council's annual report shows a marked increase in the membership, and substantial progress in the work of the society. Mr. E. G. Wheeler, commissioner for the Duke of Northumberland, was elected president for the ensuing year, and Mr. Dudley W. Drummond was elected vice-president.

LIVERPOOL ARCHITECTURAL SOCIETY.—The first ordinary meeting of the members of this society was held on Monday evening, in the New Laboratory, Harrington-street, when the presidential address was delivered by Mr. John Woolfall, F.R.I.B.A. In the course of his remarks Mr. Woolfall said it was a matter for congratulation from an architectural point of view that the City Council were exerting themselves in many large schemes, and that the Dock Board were about to build a magnificent block of new offices; and that their municipal rulers were determined to beautify the city. He hoped they would watch the streets which lead to the site of the proposed cathedral, as opportunities might occur for the making of a grand thoroughfare from the centre of the city. He would like to see new law courts built in the city, and St. George's Hall used as a people's hall, with exits to the new terrace and gardens adjoining, and where music could be heard the year through. He believed that the Art Gallery would have to make room for a larger and better building. Concluding, he emphasised the importance of erecting residential flats for the accommodation of the middle classes.

The Abram Cottage Hospital, near Wigan, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The supply of water from Lake Vyrnwy furnished by the Liverpool Corporation to the townpeople of Wallasey was formally inaugurated on Saturday. To conduct the water from the Liverpool aqueduct to the Gorse Hill reservoir—a distance of about three miles—a main has been laid by the district council at a cost of £17,500, whilst a further sum of £27,000 has been borrowed for the construction of a new reservoir adjoining the existing one at New Brighton.

At Tynemouth the monument which has been erected to record the names of the soldiers of the place who served during the war in South Africa was unveiled by the Right Hon. W. Brodrick, M.P., on Friday. The monument has been designed by Mr. Arthur B. Plummer, architect, Newcastle, and the sculptor is Mr. Robert Beall, of Newcastle. It is of red sandstone, and stands in front-street, its height being about 12ft. It is Renaissance in treatment, and consists of a square pedestal raised on two steps; above this is a smaller die, and a high pyramidal finial.

At the Incorporated Law Society's congress at Liverpool, on Tuesday, Mr. J. S. Rabinstein read a paper on "The Blight of Othelloism," with special reference to the working of the new experimental system of compulsory registration of title under the Land Transfer Act of 1897, which since Jan. 1, 1899, has been on trial in the county of London.

WATER SUPPLY AND SANITARY MATTERS.

AN EPIDEMIC AT CHELMSFORD.—Dr. J. C. Thresh, medical officer of health to the Essex County Council, has issued a report on an extensive epidemic of diarrhoea which broke out in August last in Chelmsford and the adjoining village of Widford, and which he found to have occurred only in districts supplied with mixed waters derived from two sources, the smaller of which gave evidence of having been contaminated while in a tank reservoir. Further investigations showed that the plans prepared by the late borough surveyor, recently deceased, for the protection of the tanks had not been adhered to. Had they been carried out as originally prepared, pollution would have been impossible; but Dr. Thresh is unable to say who is responsible for the altered construction.

LEGAL INTELLIGENCE.

IN RE E. MESSITER.—At Bankruptcy Buildings, W.C., on Friday, the first meeting of the creditors was held under a receiving order made against the estate of Edward Wade Messiter, builder, of 9, Wilbraham-place, Sloane-street, S.W. Mr. G. W. Chapman, Official Receiver, presided. A statement of affairs was filed showing gross liabilities £134,177 3s. 2d., of which £122,220 was returned as fully secured, and £11,929 19s. 8d. as expected to rank, and assets estimated to produce a surplus of £16,748 2s. 5d. The debtor states that he has been adjudicated a bankrupt on two occasions, namely, in 1882, when he was engaged in the timber trade, and in 1890, whilst trading as a licensed victualler, but he obtained his discharge from both proceedings. He commenced business as a builder in the year 1897, with a capital of £1,000, and has been engaged in building operations at Wilbraham-place, S.W., and at Fulham. He attributes his present position to inability to obtain loans upon leaseholds which had been promised him, insufficiency of capital, and general depression in financial matters consequent upon the war. An adjudication of bankruptcy having already been made, and no proposal of composition being submitted, Mr. Albert Willmott, A.C.A., was appointed trustee of the estate, with a committee of inspection.

IN RE McDOWALL AND NEILSON, TIMBER MERCHANTS, GLASGOW.—The meeting of the creditors of Messrs. McDowall and Neilson, timber merchants, was held in Glasgow on Friday. Mr. Charles E. Poynter, of Messrs. Arthur Dobell and Co., Liverpool, presided. Mr. Robert Reid, C.A.T., official factor on the estate, said that he had taken the necessary steps to secure that the creditors' rights to the stocks of timber should be preserved, and under his supervision the valuation of the whole assets had been prepared. A statement of affairs was submitted showing unsecured liabilities amounting to £99,325 8s. 5d., and free assets to the amount of £6,972, the deficiency being £92,353 8s. 5d. In the event of the rights of the trustees to several cargoes of wood, and the questionable security claims being maintained, these would bring into the general estate other £12,046 of assets.

A WORRIED PLASTERER LOSES HIS CASE.—At the Newcastle-on-Tyne County-court on Monday, James Fallon, plasterer, claimed damages from the Plasterers' Trade Union for having conspired to interfere with him in his employment. The plaintiff alleged that the society imposed a fine upon him for having worked on a "non-society job," and that when he refused to pay it the society induced his employers to dismiss him under a threat that if he was not discharged the members of the society would be withdrawn from work. One employer, however, stated that he was dismissed for asking a "sub," and another because work was short; though the former said that the plaintiff would probably have been dismissed because of trouble with the society. He added that an employer could not live in Newcastle with non-union men. Judge Greenwell, in finding for the defendant society, said the society had undoubtedly worried the plaintiff, but he was unable to see that he had suffered any damage or had any cause of action.

ARBITRATION CASE AT LEITH.—The proof in an arbitration in connection with a claim for £12,000 by the trustees of the late John McFarlane, United Wire Works (Limited), Leith Walk, took place on Friday and Saturday in the S.S.C. Library, Parliament House, Edinburgh. The Caledonian Railway Company have compulsorily acquired property belonging to the trustees in connection with the formation of a new goods station at Stead's Place, Leith Walk. The arbiter for the claimants was Sheriff Jameson, instructed by Messrs. G. M. Wood and Robertson, S.S.C., and for the Caledonian Railway Company, James Watts, W.S., of Messrs. Davidson and Syme, instructed by H. B. Neave, solicitor to the company. The oversman was Charles J. Guthrie, K.C. The witnesses examined on Friday for the claimants were G. Lennox Beattie, W. Galloway, George Smellie, Glasgow; and William Ormiston, late Dean of Guild. On Saturday the railway company's witnesses, T. P. Mar-

wick, architect; George Simpson, burgh assessor, Leith; Frank Burnet, and Thomas Binnie, of Glasgow, and others, were examined.

WATER BOARD ARBITRATIONS.—At the meeting to-day (Friday) of the Metropolitan Water Board, the special arbitration committee will recommend the adoption of agreements with the Tottenham and Enfield District Councils for the acquisition of their water undertakings respectively for the sums of £77,750 (against £103,452 claimed originally) and £66,000 (against £121,000 claimed originally). Tottenham will have to discharge outstanding loans, debts, &c., amounting to £48,000, out of the sum received, and Enfield liabilities amounting to £57,000. In each case the Water Board will pay smaller sums in addition for capital expenditure undertaken by Tottenham and Enfield since negotiations were initiated.

CHIPS.

The architect of the new workhouse infirmary for the Stockport Board of Guardians, of which, as we mentioned last week (p. 476), the foundation-stone has just been laid at Stepping Hill, Hazel Grove, is Mr. W. H. Ward, of Birmingham. The work is being carried out by Mr. Daniel Eadie, contractor, of Stockport, the contract entered into with the guardians amounting to £39,980, equivalent to about £120 per bed.

On Thursday in last week a stained-glass window, which has been placed in the Church of St. Barnabas, Gillingham, Kent, in memory of the late Dr. E. H. Hugo, was unveiled. The window is situated behind the altar, and represents our Lord in Majesty, surrounded by representatives of the Church and Holy Angels.

The new branch stores which have been erected at Walbottle by the Throckley District Co-operative Society, Limited, the work having been carried out by Mr. John Jackson, contractor, Newcastle-on-Tyne, were formally opened on Saturday. The architects are Messrs. Liddle and Browne, of Newcastle.

On Friday Colonel Durnford, one of the inspectors of the Local Government Board, held an inquiry at the public offices at Skegness with respect to an application for sanction to a loan of £10,360 for the purpose of the completion of a sewerage scheme, to embrace the whole district, including the growing district of the Seacroft estate at the south end of Skegness, where the golf links are situated. The details of the scheme were described by Mr. Elliott, of Messrs. Elliott and Brown, of Nottingham, the engineers.

The new parish hall for St. Mary's, Bridgewater, was opened by the Bishop of Bath and Wells last week. It has been built by Messrs. Gleed Bros., of Bridgewater, from plans prepared by Messrs. Samson and Cottam, the contract for the work being £800.

As a memorial to the Rev. North Pinder, rector of the parish from 1860 to 1901, improvements and additions have been made to the church of Rotherfield Greys, near Henley. These consist of a stained-glass window of two lights representing the B.V.M. in St. John's house at Ephesus, and a new altar carved by Messrs. Harry Hems and Sons, of Exeter. Advantage was taken of the opportunity to rescue the ancient 14th-century brass of Sir Robert de Grey from the place to which it had unfortunately been relegated at the restoration of the church many years ago, and refix it in the centre of the chancel.

The Local Government Board has sanctioned an extension of the boundaries of the borough of Portsmouth, by which the whole of Portsea Island will be brought within the control of the Corporation.

The Museum of Practical Geology in Jermyn-street, which has been closed for redecoration, has been reopened to the public during the usual hours, including Saturday and Monday evenings and afternoons.

An important discovery of a Roman sculptured stone has been made in Sunderland by Mr. John Robinson, a local antiquary. It is the first example of Roman sculptured work found at Wearmouth; it is built into the only remaining wall of the old rectory buildings, made famous as the residence of Archdeacon Paley. The stone measures 2ft. 7in. by 12in.; it is much weather-worn, yet the letters V. S. L. M. are quite distinct, as well as one portion of a beautiful ornamental scroll. The initial letters are the usual terminal inscription found on Roman altars—*Votum Solvit Libens Merito*.

The Mayor of Deptford laid on Wednesday the foundation-stone of a new Town Hall for the borough, which is to be erected on a central site in the Newcross-road. The building is to cost £30,000. The builder is Mr. H. L. Holloway, and the architects are Messrs. Lanchester, Stewart, and Rickards, whose design, selected in competition, was illustrated in the BUILDING NEWS for Oct. 24 and Nov. 14, 1902.

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Our Illustrations.

PROPOSED NEW CHURCH, MIDDLESBROUGH.

THIS is a design submitted in competition for a proposed new church at Middlesbrough. The conditions were that the church should accommodate 800, and it was suggested that the building should be carried out in a Romanesque treatment. The materials proposed to be used were local red brick for walling with dressings, piers and arches of Danhouse stone, and terracotta. The roof of nave to be covered with Westmoreland green slates, and of apses with Broseley red tiles. The estimated cost, exclusive of upper part of tower, was £10,000. The architects are Messrs. R. Lofthouse and Sons, Middlesbrough.

SHIPTON COURT, SHIPTON-IN-WYCHWOOD, OXFORDSHIRE.

THIS fine old typical mansion, which we illustrate from drawings shown at the Royal Academy this year, was erected in 1603. At a later date, the mullion windows having decayed, the building was restored in the Georgian manner, sash windows being inserted, deal panelling and other finishings provided, and various alterations of the plan effected. In the present restoration (1903) the sash windows being decayed, new stone mullion windows in conformity with ancient work have been introduced. The walls strengthened and repaired, and additions made to adapt the old building in every respect for use as a convenient modern residence, with new oak panellings, plaster ceilings, and fitted bedrooms, modern sanitation, water supply, and electric light. The additions to the mansion are a winter-garden, a billiard-room with private office and workshop under, a tower, with cisterns for water storage, a new porch, and extension of the kitchen offices. There is an extensive range of stabling which has been restored and brought up to date, and new cottages erected for coachman and gardener. Every effort has been made to retain the effect of old work, which is much assisted by the fine old yew hedges, and the laying out of the ancient gardens. The work has been designed by and carried out under the personal supervision of Mr. G. B. Bulmer, R.R.I.B.A., of the firm of Messrs. Perkins and Bulmer, architects, Leeds.

A SURREY RESIDENCE.

THIS house has been erected near Sidlow, Reigate, from the plans of Mr. C. E. Salmon, architect, Ball-street, Reigate, whose drawing, now given, was in this year's Royal Academy. The ground floor is faced with local red facing bricks (Trowers). The upper portions hung with weather tiles. All the tiles for roofs and hangings are red sand-faced hand-made tiles from Messrs. S. E. Collier, of Reading. The lead lights and lead work designs were specially made. The spandrels of the large circular

headed window lighting hall were built of T.L.B. rubbers, and carved by Messrs. T. L. Bradford and Sons to cartoons by the architect. The sills are of Box Ground Bath stone to an appropriate section. All the oak panelling in hall and billiard-room, as well as oak staircase, was supplied and executed by the contractors, from the architect's details. The contractors were Messrs. W. Bagaley and Sons, of Mead Vale, Redhill.

PUBLIC BATHS AND WASHHOUSES, OLD KENT ROAD.

THIS building, illustrated from a drawing shown this year at the Royal Academy, is now in course of erection, and the present design is a modification of the one submitted in competition, and which was illustrated and described in the BUILDING NEWS of March 28, 1902. The plinth is of Blue Forest of Dean stone, and the remainder of the stonework is Portland. There are brick facings to front and side elevations, and the slating will be green Tilberthwaite. The architect is Mr. E. Harding Payne, A.R.I.B.A., of 11, John-street, Bedford-row, W.C., and the builder Mr. A. N. Coles, of Plymouth. Mr. Wm. Lake is the clerk of works.

GORDON MEMORIAL HOME, NOTTINGHAM.

THIS home was founded in memory of Major General Charles George Gordon, C.B. The foundation-stone was laid with Masonic ceremony by his grace the Duke of Portland, Provincial Grand Master, on August 5 last. Accommodation will be provided for 104 boys. In the basement are arranged a large recreation and drill hall, cloakrooms, drying-rooms, day lavatories, boot-cleaning and brushing rooms. The library and waiting-rooms face the street. On the ground floor is the dining-hall, with kitchen, scullery, larder, &c., adjoining. The committee, waiting-room, &c., are on the south side of the principal entrance; the office, master's and matron's rooms on the north. On the first floor accommodation is provided for 52 boys in two dormitories, with lavatory and bathroom adjoining. The hospital-room, with separate bath and w.c., are placed on this floor; also the master's and matron's bedrooms. On the second floor similar accommodation is provided in the dormitories and the staff bedrooms. Fire-escape staircase is provided from the dormitories. The walls externally are of red brick, with Derbyshire-stone dressings. The contractor is Mr. F. Messom; the mason, Messrs. Ward and Adkins; plumbing and sanitary work, Messrs. Humphrey and Co.; the architect, Mr. Ernest R. Sutton, Bromley House, Nottingham. The drawing was hung in the Academy of this year.

AN OLD FRENCH RENAISSANCE WARDROBE, CHEST, AND CHAIR.

THERE is not much to say about these three pieces of furniture, which are self-explanatory. The largest of the three was evidently designed to harmonise with the wall panelling of the room for which it was intended, and no doubt formed an essential feature in the apartment, though the arrangement of the central panel, which has an applied look more free than commendable, hardly befits a door treatment, more notably in the way in which the base of the panel is managed. The columns and their pedestals also are borrowed in idea too much from stone features, while the niches behind are more fanciful than good. In earlier work such vagaries had not been invented.

The Annual Conversazione of the Architectural Association will be held at the Royal Institute of Painters in Water Colours, Piccadilly, on Wednesday week, Oct. 23, at 8 p.m. A selection of students' work and prize drawings will be exhibited.

Lieutenant-General Lord Methuen on Saturday afternoon unveiled the memorial stone of the St. Matthew's, Bethnal Green, parish building. The new building is being erected on a part of the rectory garden, and will cost £3,000. On the first floor it provides a parish hall, which will accommodate 400 people, and can be used as a gymnasium and as a place for meetings and concerts, while on the ground-floor there are two sets of club-rooms, one for boys and one for men.

The Gas Committee of the Glasgow Corporation considered, on Monday, the short list of candidates for the gas managership, vacant by the death of Mr. Foulie. After discussion, it was decided to recommend the appointment of Mr. Alexander Wilson, at present manager of the works at Daws-helm. The salary attached to the position is to be £1,000 per annum.

COMPETITIONS.

CHRISTIANBURG, DENMARK.—The Bill just introduced in the Danish Folkething for the rebuilding of Christianborg Castle provides for the appointment of a commission which is to institute a competition for plans of the new building. About £550 is the highest premium. The Castle will be utilised for Court functions, for the reception of Royal visitors, and for the meeting of the Rigstag. The outlay on the building, exclusive of decorations, is estimated at £333,000.

HEYWOOD.—The drawings received by the committee in connection with the competition for a public free library will be on view to the public and competing architects in the lecture-hall of the Technical School to-day (Friday) and to-morrow from 10 a.m. to 9 p.m. Mr. J. Ainsworth Settle, A.M.I.C.E., the borough engineer of Heywood, informs us that sixty sets of designs have been sent in.

CHIPS.

By the death of Mr. George Gilbert, the brother of Sir John Gilbert, R.A., who made a munificent gift of works of art to the City Corporation some years ago, the permanent collection of pictures in the Guildhall Art Gallery is likely to be augmented considerably. The deceased has bequeathed a number of water-colour drawings and oil-paintings, which were given to him by his brother, to the Corporation. In the event of the Corporation refusing the gift, the pictures will go to the Tate Gallery.

At the last meeting of the Metropolitan Public Gardens Association a further letter was read from the London County Council declining to contribute to the acquisition of St. Peter's-square, Hammersmith, a fine enclosure of 1½ acres in extent, which is in danger of being built over, owing to the high price, £12,500, asked. It was considered that every effort ought to be made to prevent the obliteration of London squares, and that the Council should be asked at what price it would be prepared to assist in the purchase.

The dissolution is announced of the partnership hitherto existing between H. B. Leigh and W. H. Rayner, Lillie-road, Brompton, S.W., under the style of Ellis Leigh and Co., architects, &c., and Finborough-road, South Kensington, S.W., under the style of Brooks and Co., builders, &c.

Mr. P. C. Cowan, chief engineering inspector to the Local Government Board for Ireland, has held an inquiry in Dublin relative to an application of the corporation for sanction to loans of £76,000 and £8,238 for the purpose of defraying extra expenditure in connection with the electric lighting scheme, and carrying out wood-paving, asphaltting, and concreting works generally. Mr. Robert Hammond, of Westminster, consulting electrical engineer to the corporation, gave evidence in support of the application.

The resident engineer for the construction of the new marine drive and promenade round Scarborough Castle foot, in a report to the corporation, states that the undertaking will be completed early in 1905.

Only a limited amount of business was done at the Mart in Tokenhouse-yard last week. Weekly rents were much in evidence, and this class of property changed hands freely, but, with the exception of a large piece of land at West Ham, which at £15,000 was withdrawn, scant attention was paid to the higher-priced investments. The returns amounted to only £33,800, which represent exclusively property sales. The sales at the Mart for the corresponding week of last year amounted to £89,635.

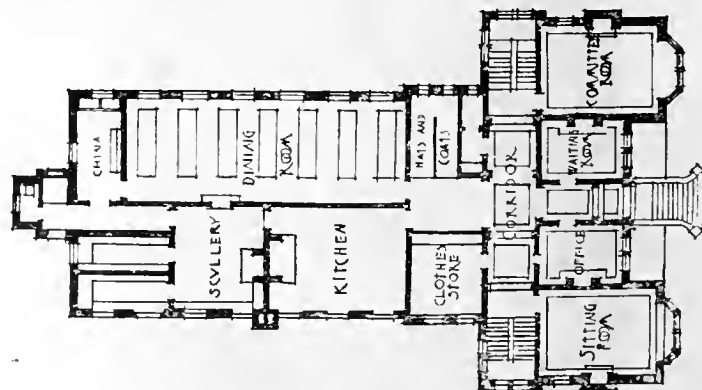
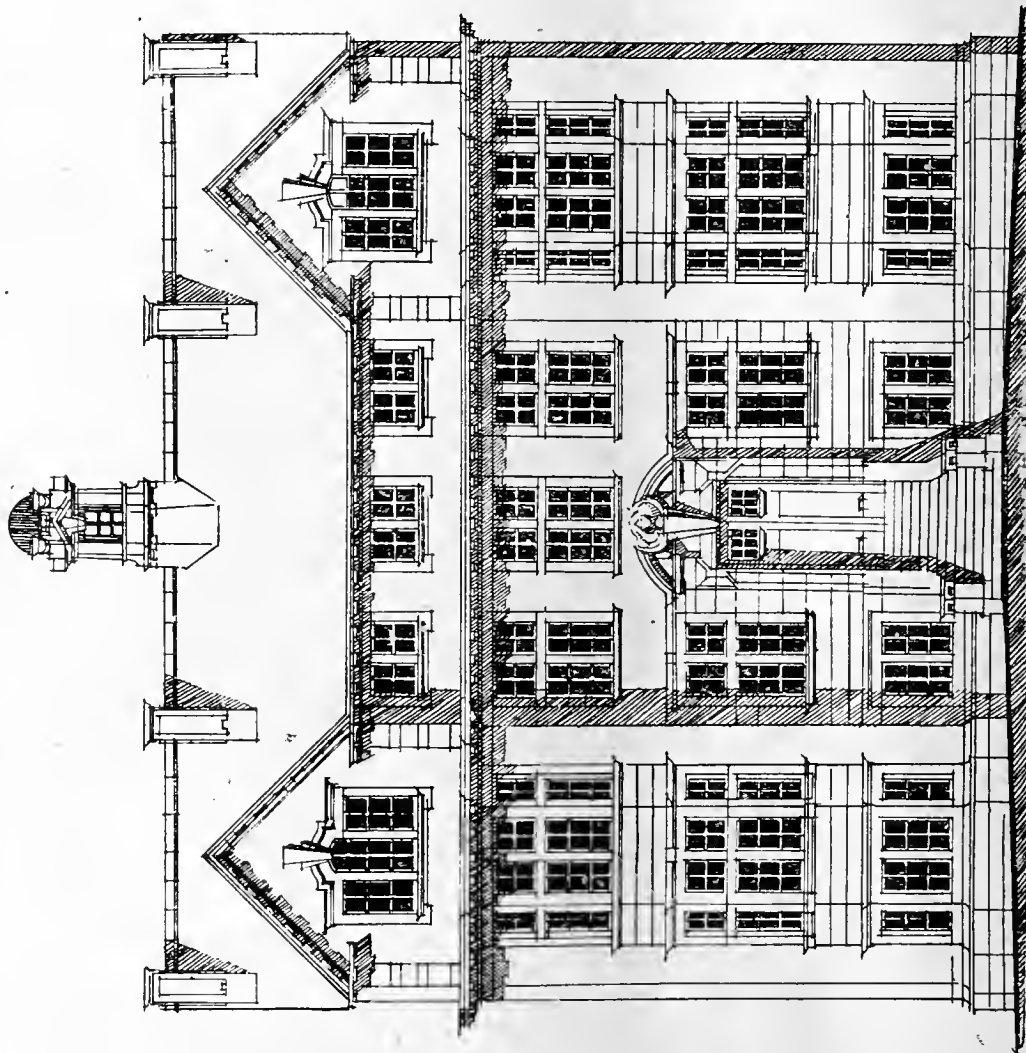
The new Town Hall at Oundle was opened by Lord Lilford on Wednesday week. The building, which faces West-street, is entirely of stone, with Weldon facings. The main room is 60ft. by 40ft. in dimensions. There is an elevated platform, 13ft. deep, with footlights, beneath which is a dressing room. A large gallery is reached by a flight of stairs, with pitch-pine rails and oak balustrade. The cost has been £2,500. Messrs. Siddons and Freeman were the builders, and Mr. J. Corby, of Stamford, was the architect.

The commission which is to have in hand the building of Mr. Carnegie's temple of peace at The Hague has been elected, and has held its first sitting. The Dutch architects have coolly asked the Minister to promise that the architect to be entrusted with the work, which is to cost £300,000, shall be a Dutchman.

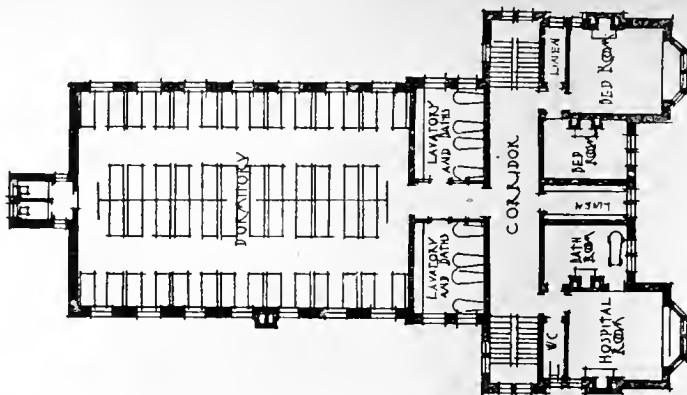
A stained-glass window has been set up by the family to the memory of Mr. Charles Hill, of Clevedon Hall, in the baptistry of Bristol Cathedral, under the south-west tower. The window shows the continuity of the baptismal rite under the old and new dispensations and on to the final establishment of Christianity in England.

GORDON MEMORIAL.
HOME NOTTINGHAM.
ERNEST R. SVETTON ARCHT.

FRONT ELEVATION



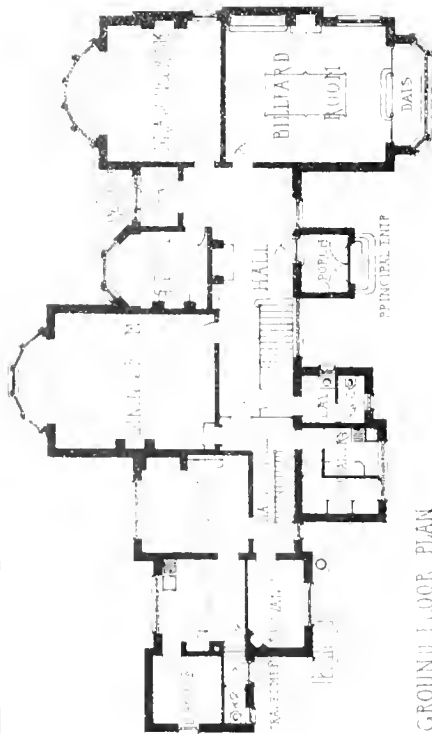
GROUND PLAN.



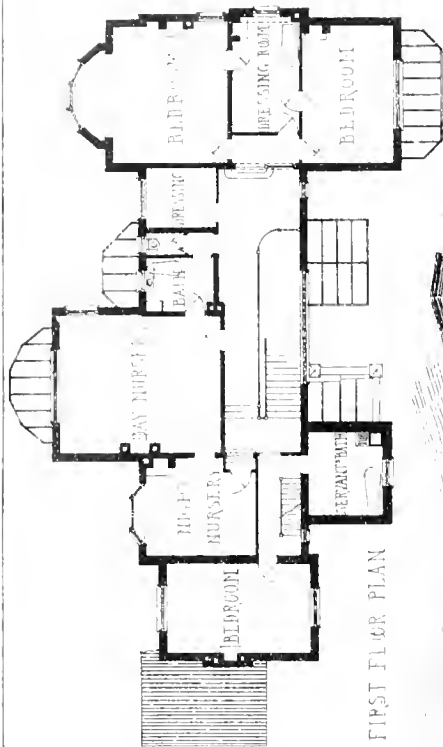
FIRST FLOOR PLAN.

A SUPERF. RESIDENCE

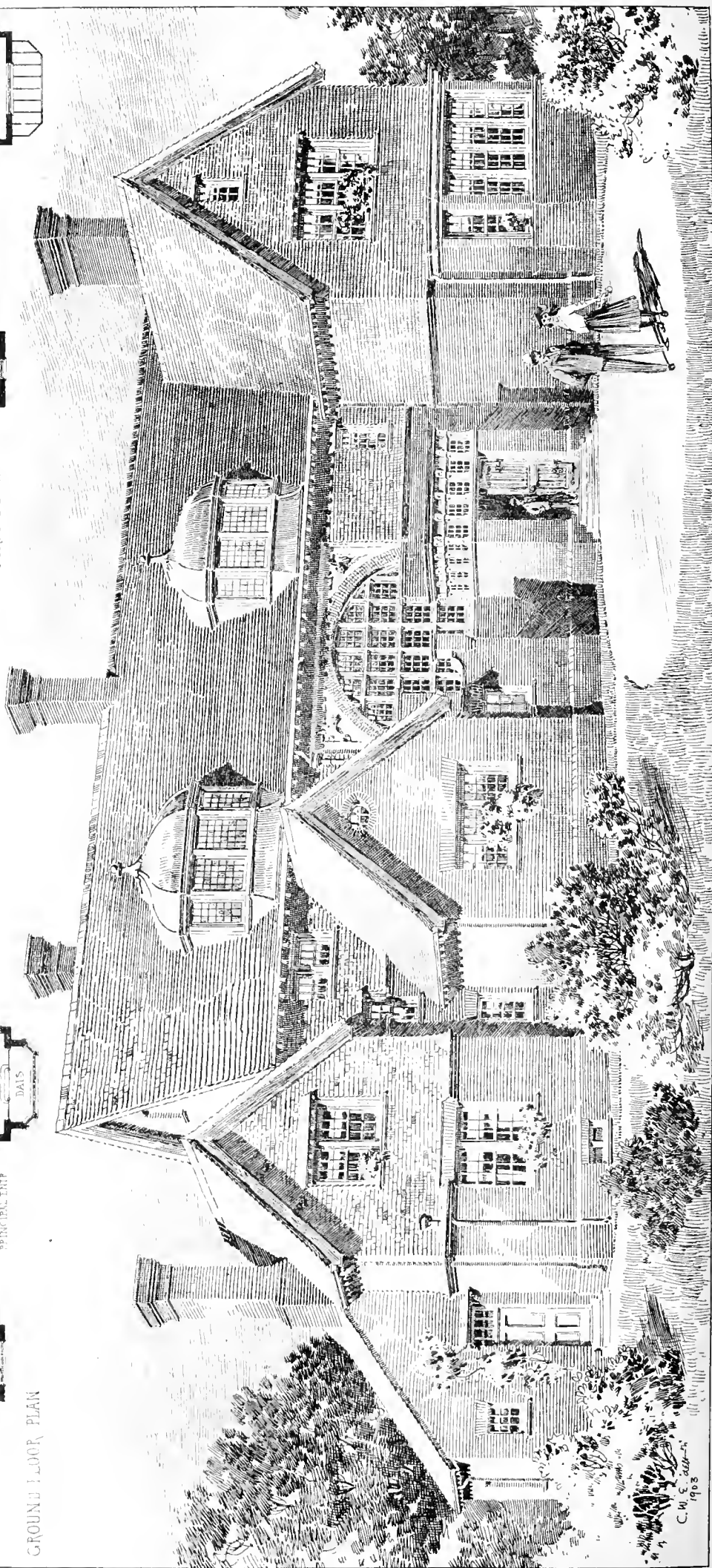
DESIGNED BY C. E. SALMON
Architect



GROUND FLOOR PLAN



FIRST FLOOR PLAN

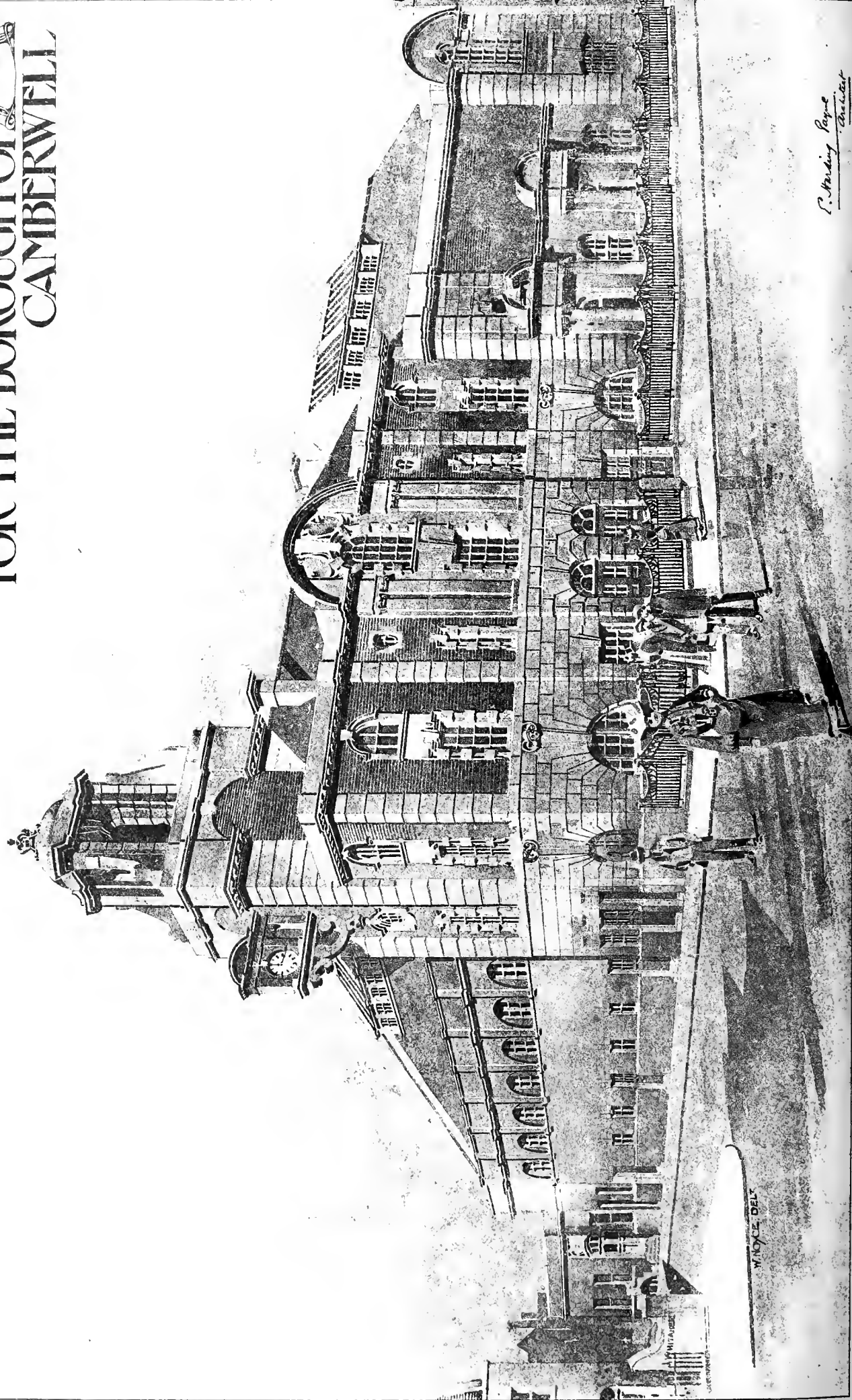


C. W. S. 1903



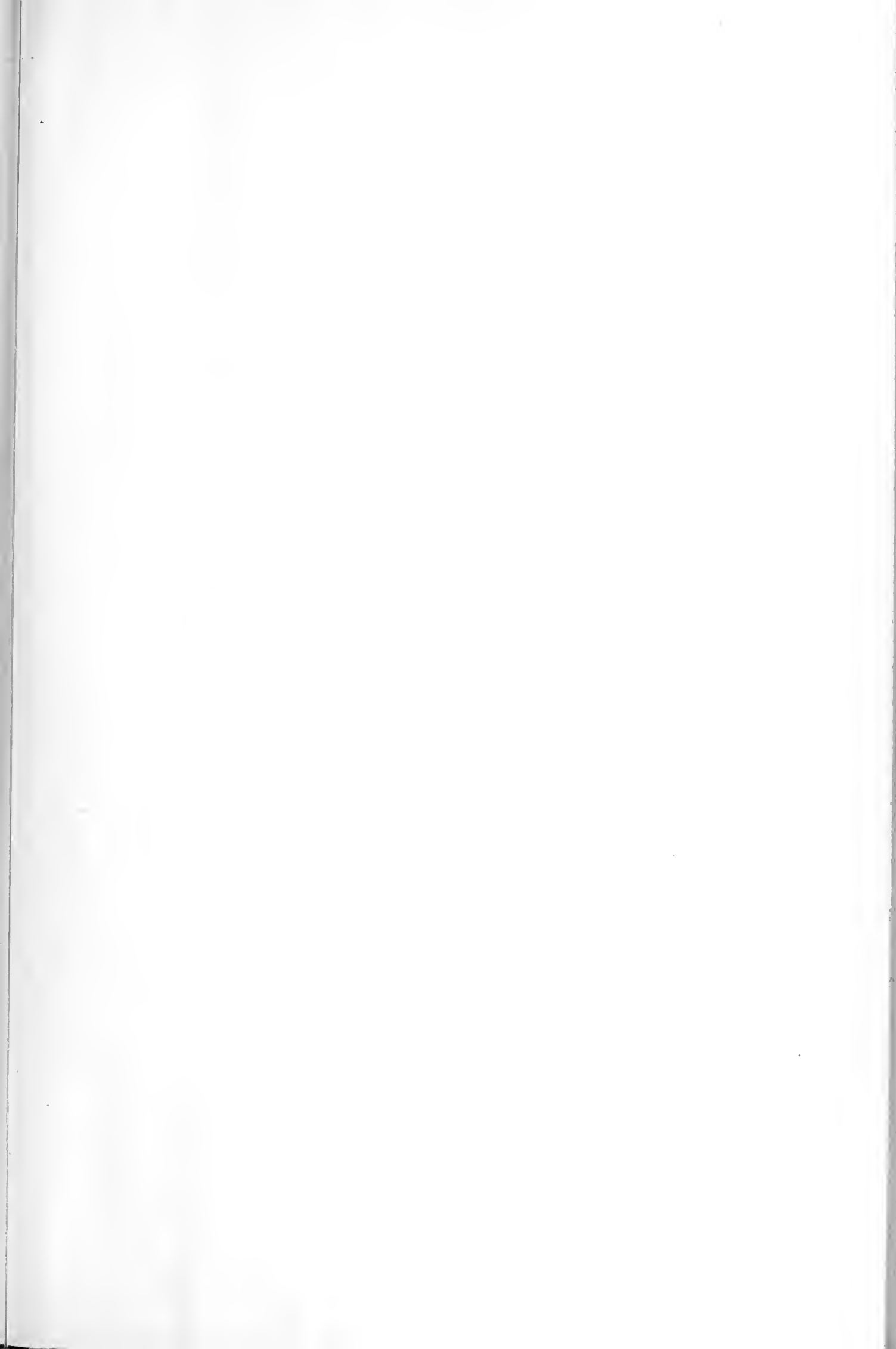
THE BUILDING DEWS, OCT R 16, 1903.

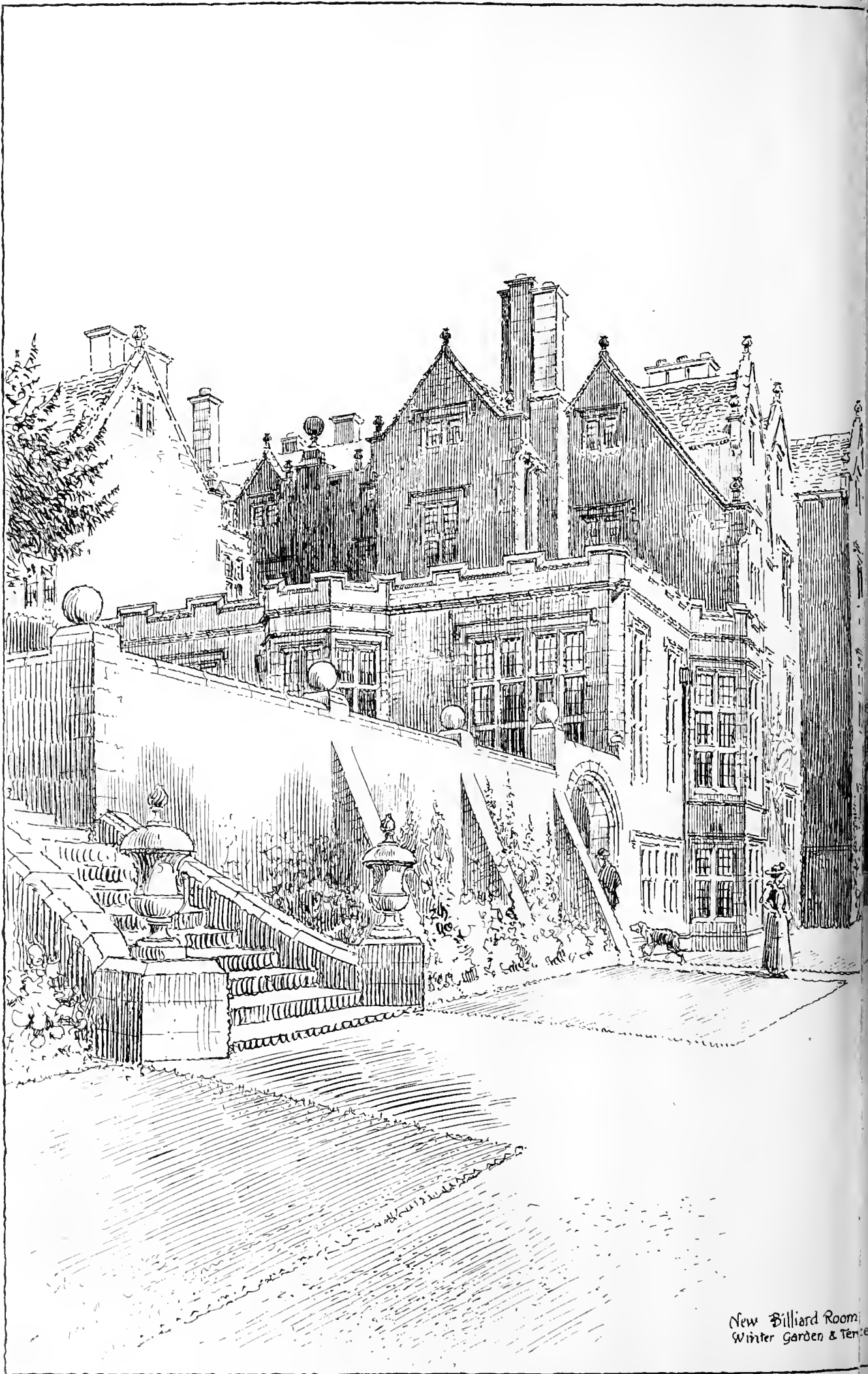
PUBLIC BATHS OLD KENTRD FOR THE BOROUGH OF CAMBERWELL



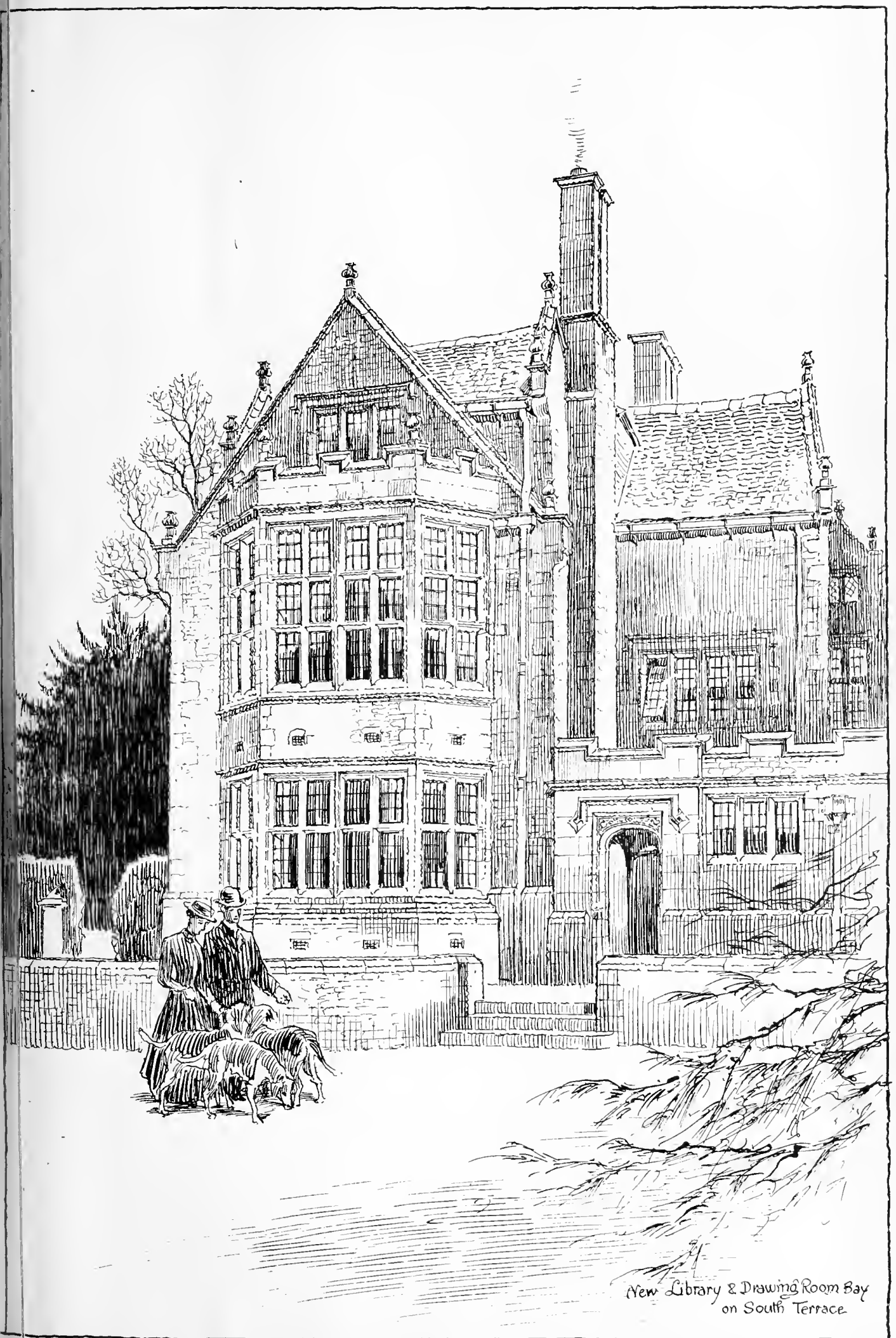
W. NO. 2. DEL.

*P. M. King Payne
Architect*

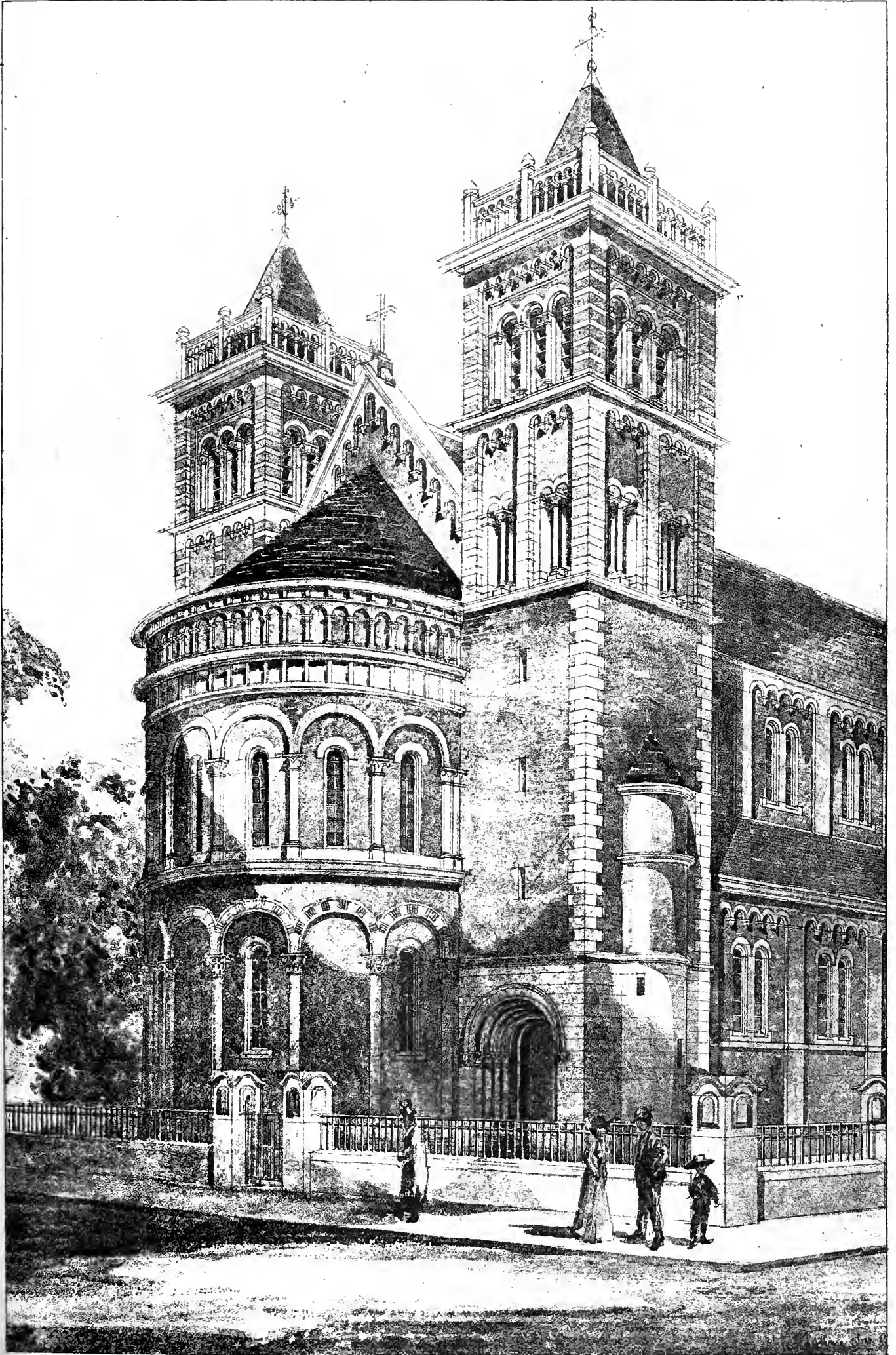




New Billiard Room
Winter Garden & Terrace



New Library & Drawing Room Bay
on South Terrace



CHURCH AT MIDDLESBOROUGH · MESSRS LOFTHOUSE & SON ARCHTS

PHOTO-TINT by James Akerman 8, Queen Square London W.C.

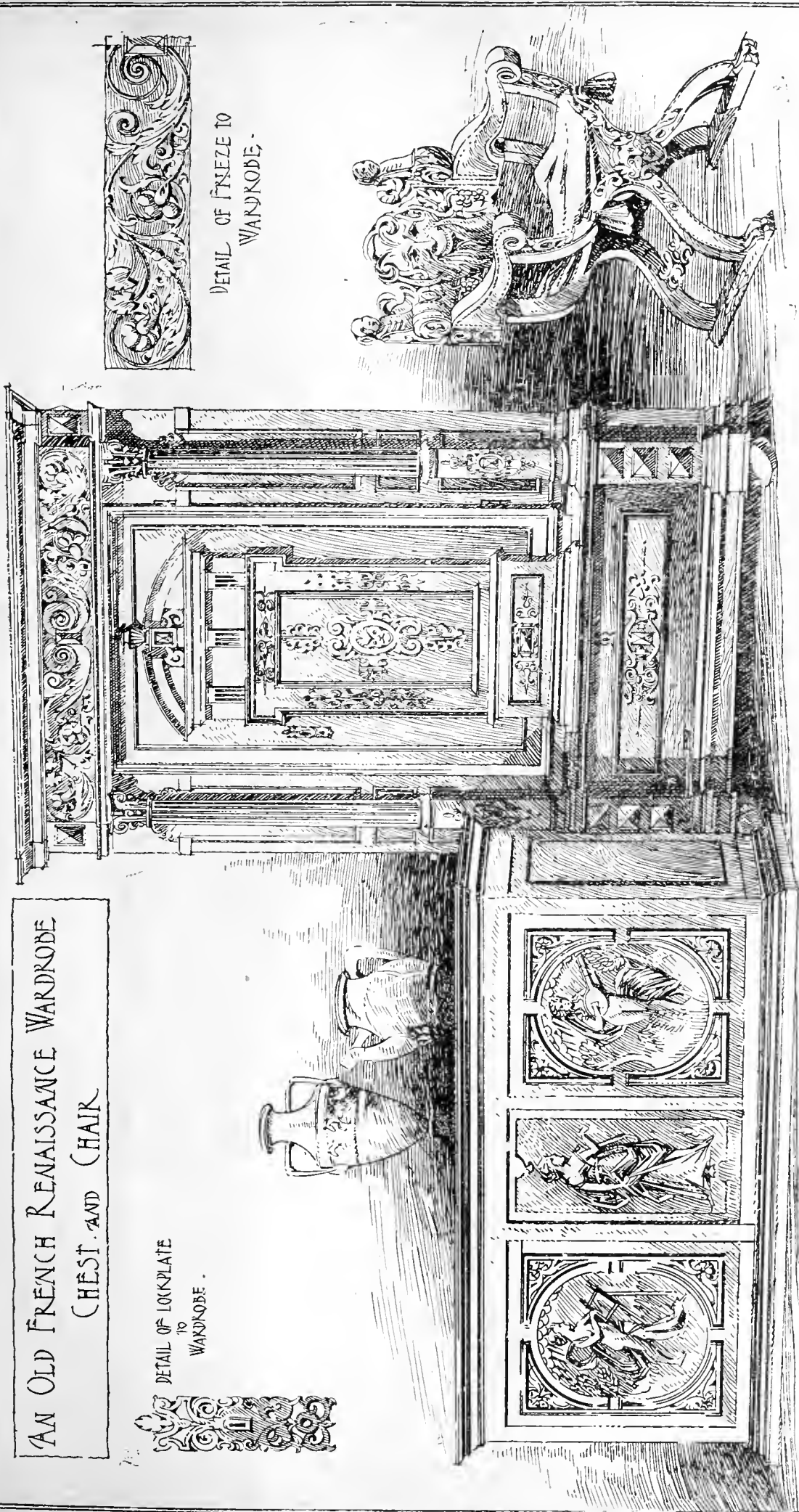


New Entrance Porch

Photo Lithographed & Printed by James Ackerman 6 Queen Square W.C.

ADDITIONS SHIPTON COURT OXON MESSRS DERRICKS & POLMER ARCHTS





AN OLD FRENCH RENAISSANCE WARDROBE
CHEST AND CHAIR

DETAIL OF LOOKPLATE
TO
WARDROBE.

DETAIL OF FRIEZE TO
WARDROBE.

W. J. W. W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telegraphic Address:—"Timeserv, London."

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XLI., XLVI., XLIX., LI., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. 25s. of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 6d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 6d. (or 3fr. 30c.). To India, £1 6s. 6d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 6d.

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The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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* Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—W. E. C.—B. M. and Co.—H. C. (Bolton).—F. W. M.—R. S. and Sons.—W. M. B.

E. C.—The composition you mean we expect is Szerelmey's. Write Szerelmey and Co., 217, Rotherhithe New-road, London, S.E.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"White Heather."

H. SUTTON.—The covered playground can be in the half-basement under part of the building for the second dry school, which is itself to be arranged in two floors—one ground floor and one the first floor, as stated in the conditions.

H. SCHLIPPE.—We have already stated in reply to correspondents on Oct. 2, p. 413, that the plans of the school may be drawn to 1/16th of an inch scale, keeping to the 1/16th scale for elevations and sections.

Correspondence.

COMPETITION REFORM SOCIETY.

To the Editor of the BUILDING NEWS.

SIR,—Re Competition for additions to Jeffs' Poplar Hydro, Matlock Bank. The Committee disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: No professional assessor. The Council

do not bind themselves to adopt or carry out any of the designs submitted, &c. Premiums insufficient.

Re Competitions for (1) shops and workmen's dwellings, Burch of Kilmarock; (2) public library, Coedfranc, Skewen; (3) pavilion and winter gardens, Bray, County Wicklow. The Committee disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: No professional assessors. Insufficient premiums. The promoters do not bind themselves to adopt or carry out any of the designs submitted, &c.

Architects are requested to abstain from competing unless they receive a further communication to the effect that the conditions have been satisfactorily revised.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

10, Gray's Inn-square, London, W.C., Oct. 13.

CONSTRUCTION OF DRAINS—STRANGE STATE OF THE LAW.

SIR,—On Oct. 6, the Sheffield stipendiary decided (in a case prosecuted by the corporation for breaking their by-laws) that all rain-water pipes and waste pipes must be trapped immediately they reach the ground, as the point where it enters the ground is the inlet to the drain under the model by-laws, notwithstanding that at some distance away all such waste and rain-water pipes emptied into a disconnecting gully next the drain from the w.c., and further, that, as the bottom of a rain-water pipe is next the wall, there the gully must be.

This decision is against the modern method of collecting waste pipes and rain-water pipes to one central disconnecting gully; and if it is correct law—which I very much question—our sanitary laws are in a deplorable condition. Can any of your readers refer me to any Court cases on this point affirming, or otherwise, this decision, or inform me whether the disconnection of wastes, &c., in model by-laws does not implicitly mean disconnection from the pipe or drain conveying liquid and solid fifth—i.e., from w.c.'s and slopsinks?—I am, &c., JAMES G. D. ARMSTRONG, Sheffield. Mem. San. Inst.

At Tuesday's meeting of the London County Council a recommendation of the Bridges Committee for the reconstruction of Lambeth Bridge at an estimated cost of £872,000 fell through, the necessary two-thirds majority not being obtained on a motion for the suspension of standing orders; but an estimate of £1,340,000 for the construction of a tunnel under the Thames between Rotherhithe and Shadwell was approved after discussion.

The Local Government Board have notified the Bromsgrove Rural District Council of their sanction for a loan of £7,445, for the carrying-out of schemes for draining Hagley and Blakedown.

Mr. W. McIntosh, engineer and surveyor to the Cuckfield Rural District Council, has been appointed surveyor to the West Sussex County Council, at a salary of £250 a year.

At St. Albans a new Congregational church, built at a cost of £11,400, was opened on Thursday in last week. It is situated at the junction of Victoria-street and Beaconsfield-road, and is seated for 700 persons. Messrs. Smee and Mence, of St. Albans, were the contractors, and Messrs. Miskin and Son, of the same city, were the builders.

Lord Brassey, on Thursday night in last week, opened the new village hall which he has presented to the parish of Catsfield, Sussex, where Normanhurst is situated. The building is of red brick surmounted with rough casts. On the ground floor is a room for entertainments, and above are billiard, reading, and committee rooms.

Founder's Day at Harrow, celebrated on the 8th inst., was rendered memorable by the dedication by the Bishop of London of the addition made to the school chapel in memory of those Harrovians, 55 in number, who lost their lives in the late war in South Africa. At a cost of £8,820, transepts have been added to the chapel on either side of the chancel. Porches have been built at the two main entrances, the big western door having been moved to the south side of the chapel, exactly opposite to the main north entrance. The architects were Mr. Aston Webb, R.A., and Mr. Ingress Bell. In each transept a sculptured memorial has been placed, showing the names of those in whose memory the fund has been raised, the figures of St. George, St. Michael, St. Andrew, and St. Patrick, which are to be placed round the tablets, being sculptured by Mr. Drury, A.R.A. The chapel dates from 1857, and the south aisle was a memorial to those officers educated at Harrow who fell in the Crimean War.

Intercommunication.

QUESTIONS.

[12013].—Old Coffins.—Old stone coffins are, of course, numerous. Are there, however, any instances of Medieval coffins cut out of solid wood?—SHARPE.

[12014].—Half-Timber Work.—I am desirous of covering a wall with half-timber and plaster in the old black-and-white style. The timbering to be 2in. in thickness, and varying from 4in. to 7in. wide, with 1in. thick plaster panels between. I should prefer oak, but fear it is too expensive, so should be very glad if anyone would suggest what is the next best substitute that can be stained nearly black to match some real old work adjoining.—ARTIST.

REPLIES.

[12010].—Smoked Bricks.—Try weak solution of spirit of salt, or chloride of lime, or ammoniacal liquor, or cream of tartar.—REGENT'S PARK.

[12011].—Electric Lighting.—You would be able to charge up to about twenty cells with your 55v. dynamo. (1) No; because there are no Nernst lamps made of so low a voltage as 55v. (2) No; because the voltage of the thirty cells exceeds that of the dynamo. (3) Better have a proper automatic gas governor. (4) One containing two lever switches, one ammeter, and one voltmeter. See my book, "A Guide to Electric Lighting." (5) No; a good shunt will suit you better, because of charging the accumulators. (6) No; the speed is too great, and as they are not running through the air, they soon get frightfully hot. (7) Yes.—S. BORTONE.

[12011].—Electric Lighting.—See that engine has a good flywheel. (1) You can, and they are very economical, but must have no great fluctuation in voltage. (2) Yes. (3) Yes, and very desirable if well constructed. (4) Each one is the same in the essentials, differing in details. Maker will give you instructions for fixing. (5) A compound dynamo is the best for lighting direct, as it is practically self-regulating. Cut out series winding when charging accumulator. (6) Don't know what you mean. (7) Yes, you can; but it would be much better to use one large one for the lot.—LOSA JOUX.

[12012].—Level.—"Surveying Instruments," by W. F. Stanley, of Great Turnstile, W.C., has several pages on ordinary and improved dumpy levels.—REGENT'S PARK.

CHIPS.

Mr. C. Lynam, F.R.I.B.A., has decided not to seek re-election on the Stoke-on-Trent Town Council, of which he is one of the oldest members, but he has responded to the unanimously expressed wish of his colleagues to accept the mayoralty for next year.

At the meeting of the Architectural Association Camera and Cycling Club on Wednesday evening, held at 56, Great Marlborough-street, W., a lecture on "Little Known Irish Abbeys," illustrated with numerous slides, was given by Mr. H. Oakden Wayn, F.H.A.

Major Tulloch, Local Government Board inspector, held an inquiry at the Town Hall, Tamworth, on Tuesday, respecting the application of the Tamworth Rural District Council for sanction to borrow £600 for the purchase of land in the parish of Glascoate, and £1,800 for the erection thereon of workmen's cottages, stabling, &c., for the house refuse and nightsoil department. There was no opposition.

A new Primitive Methodist Chapel was opened at Castletown, near Sunderland, on Saturday last. The new building is of brick with stone facings. It has accommodation for 240 people. The building was designed by Mr. J. H. Nicholls, architect, Sunderland, and the contractor was Mr. Morris Wright, of Monkwearmouth.

The town council of Wolverhampton, after a discussion extending over several hours, adopted, on Monday, the report of their tramways committee, recommending the adoption of the Lorain system of stud contact throughout the whole of the borough.

At the meeting of the electric-lighting committee of the York Corporation on Monday, it was reported that the sanction of the Local Government Board had been received to a loan of £10,850, for the purposes of extensions at the works, and electric lighting generally.

A special court of the Corporation of the President, vice-Presidents, and Governors of King's College Hospital will be held in the large theatre of King's College, Strand, on Monday next, at 4 p.m., for the purpose of obtaining the sanction of the members of the said Corporation to the removal of the hospital from its present site to a site in South London. This proposed removal is put forward at the initiation of both the Council and Committee of Management.

Mr. James Buchanan, of the general manager's department of the North British Railway, has been appointed manager of the northern section of the Cape-to-Cairo Railway at a salary of £1,200 per annum.

The Exeter Education Committee have retained Mr. J. W. Jerman as architect at a salary of fifty guineas a year, with a commission of 5 per cent. on new works or new buildings.

STATUES, MEMORIALS, &c.

DURHAM CATHEDRAL.—A memorial has just been placed over the remains of Bishop Richard d'Angerville (or de Bury) in the Nine Altars of Durham Cathedral. The whole cost of the work has been defrayed by members of the literary Grolier Society of New York, who desired that there should be something to mark the resting-place of the bones of one who was one of the very earliest friends of literature in Europe. This monument, designed by Mr. G. H. Kitchen, has been executed under the eye of Messrs. Vokes and Beck, sculptors, of Winchester, by Mr. John McCusham, an Irish artist. Bishop Richard was born in 1257, at a hamlet near Bury St. Edmunds, in Suffolk; hence comes his usual name of Richard of Bury. His surname of Angerville shows that he was not English in origin. Richard de Bury was Bishop of Durham from 1333 to 1345. In concluding a sketch of the bishop, the dean states that Richard was the third prelate, probably the third person, who was buried in the cathedral, and with regard to the memorial he writes:—"This beautiful piece of work deserves a word of praise and description. The thought of it comes from that fine specimen of Bishop Bury's seal which we have among the best treasures of the cathedral. From this the central figure was worked, in face, attitude, and vestments. The only change is in the book which the figure now carries under the left arm, a representation of the Philobiblon; this, far more than the pastoral crozier, is the characteristic feature of our prelate's life; the canopy under which he stands is simplified from that on the seal; and the two figures, each under his own canopy, represent Letters and Devotion. The inscriptions under these figures are from the fifteenth chapter of Philobiblon. At the four corners of the slab are shields carrying, two of them, the St. Cuthbert's Cross and two the three lions of England."

CHIPS.

Mr. John F. Smith, assistant burgh engineer, Wolverhampton, has been appointed burgh surveyor of Inverness.

The Kirkcaldy Town Council discussed, on Monday, the report of Sir A. M. Rendel, C.E., London, on the harbour extension scheme, the total cost of which he estimated at £107,000. The joint committee of the town council and Harbour Commission, to whom the report was submitted, recommended that the council approve of the scheme and proceed to make arrangements for obtaining Parliamentary powers to proceed with the work. The committee's recommendation was unanimously agreed to.

The model of the equestrian group for the summit of the Wellington Monument at St. Paul's, recently made by Mr. Tweed from the rough suggestions left by Alfred Stevens, not having met with the unqualified approval of the committee or of the public, it has been removed from the Cathedral. Mr. Tweed is now at work on a second model, which will not be a faithful rendering of the model that lay so long in the crypt of St. Paul's, but a freer interpretation of Stevens's intentions as gathered from his models and designs. When completed, this group will also be exhibited.

The city council of Nottingham at their last meeting adopted a joint report of the Water Committee and the General Works and Highways Committee, recommending the construction of a suspension bridge over the Trent, for the purpose of carrying water-mains and serving as a footbridge, at an estimated cost of £8,200.

At a general assembly of the Royal Society of British Artists, on Monday, the following were elected members:—W. B. Laund, Forbes Withersby, E. Anderson, Montford Paul, F. Carruthers Gould, Cave Day, and Fletcher Watson.

A meeting of the executive committee of the National Trust was held on Tuesday evening at the offices of the society, 25, Victoria-street, Westminster. An offer was made through Miss Octavia Hill of a gift of land comprising 3½ acres on the top of one of the Kentish Hills. The gift was accepted, and a vote of thanks to the donor passed.

Mr. J. H. Hughes, of Huddersfield, has been appointed resident engineer for the construction of the new reservoir above Blaenrhondda.

The City Corporation have agreed to pay to the Bridge House Estates Committee £50,000 for the ground belonging to the Estates required for widening London-wall and Blomfield-street between Albion-place and Finsbury House.

A meeting of clergy and laity was held at New-castle-on-Tyne on Tuesday, at which it was decided to raise a fund of £100,000 for the formation of three new parishes, the building of new churches, and for church extension work, necessitated by the growth of the diocese, the population of which has increased during the past 20 years by 200,000. It was announced that subscriptions amounting to about £25,000 had been promised or actually given.

STAINED GLASS.

WESTMINSTER ABBEY.—A new stained-glass window in Westminster Abbey was dedicated on Tuesday by the Bishop of Oxford. The window, which is placed in Poets' Corner, bears the formal title of "Translation of King Edward the Confessor," and represents incidents in the life of that Monarch. At the head of the window is a cinquefoil containing a shield bearing emblems of the Trinity, surrounded by angels holding a scroll. The lights contain two full-size figures under canopies, with six picture subjects beneath them, both lights being framed with wide architectural borders, having niches holding twenty-eight statuettes. In the left-hand light is the figure of King Edward the Confessor, the founder of the Abbey; in the right-hand light is that of St. John the Evangelist. The picture subjects, counting from the left and reading across, represent:—1st, the Coronation of King Edward the Confessor; 2nd, the building of the Abbey; 3rd, St. John the Evangelist in the guise of a beggar asking alms of the King, who, finding his purse empty, gives a valuable ring off his finger; 4th, a double picture, (a) St. John (in Palestine) handing King Edward's ring to a pilgrim, bidding him return it to the King, and announce to him his approaching end; (b) the pilgrim (in England) on bended knee, fulfilling his errand; 5th, the King on his death-bed; and 6th, the entombment of the King. The statuettes in the borders represent:—Left of left-hand light, reading from the top, Kings of England: Edward I. to Edward VII. Right side, Queens of England: Edith, Eleanor, Mary I., Elizabeth, Mary II., Anne, and Victoria. Left of right-hand light, reading from the top, St. Edwin of Northumbria, St. Oswald, King Alfred, St. Edmund, Henry III., V., and VII. Right side, Archbishops Theodore and Dunstan, Bishop Wulfstan, Archbishop Aeselm, Bishop Robert Grosseteste, and Archbishops Cranmer and Laud. The glass is the work of Messrs. Burlison and Grylls, acting under the superintendence of Mr. G. F. Bodley, R.A., and the scheme of subjects is due to Dr. M. R. James, of King's College, Director of the Fitzwilliam Museum at Cambridge.

The town council of West Hartlepool received and accepted at the last meeting the tender of resignation of Mr. J. W. Brown, for the past twenty years the borough engineer.

The death occurred at Brighton, on Friday, of Mr. John Thomas Pidditch, surveyor to the Battersea Borough Council. The deceased, who was about sixty-four years of age, had a paralytic stroke on Monday in last week, and died without regaining consciousness.

At Friday's meeting of the Herefordshire County Council the Education Committee reported that it had been arranged that the county surveyor should examine and report on the condition of the whole of the thirty-one council schools. Nearly one-half of these had been already reported upon, and in some cases considerable repairs were found to be necessary. In some instances alterations by the Board of Education had also been required.

New Wesleyan Sunday-schools were opened at Weaverham, Cheshire, last week. The buildings have cost £1,800, and provide an assembly-room 48ft. by 28ft., seating 230 children, and four large and two small classrooms. The style is Modern Gothic. Mr. A. Priest was the architect, and Mr. S. Appleton, of Northwich, the builder.

An alarming mishap occurred the other day at St. Simon's Church, Heaton-street, Hockley, Birmingham. The building, which is 60ft. by 20ft., consists of two stories, the upper floor being used for church services, and the lower as a schoolroom. Shortly after the caretaker had left the premises some heavy beams supporting the roof gave way, and brought down a quantity of masonry, wood-work, and plaster. The debris fell into a room which is used as the church.

Mr. James Bowden, of Oak House, Eudon, builder, an ex-Mayor of Burslem, and for thirty years prominently connected with public affairs, who died on August 16 last, aged sixty-five years, bequeathed to his brother, Mr. Robert Bowden, of New Mills, Stockport, joiner, his personal effects and the residue of his personal estate. His estate has been valued at £17,960 7s. 6d. gross, with net personalty nil.

A fire occurred on the 8th inst. at Crescent Foundry, Spilman-street, Mile End, London, owned and occupied by Messrs. Warner and Sons, bell founders. The flames started in a building of two floors about 200ft. by 40ft., used as workshops, pattern rooms, and stores, and the greater part of the structure was eventually gutted.

At the Bridlington Town Council meeting on Friday night £2,450 was voted for the erection of a new pavilion round the bandstand on the Parade. It was announced that the Local Government Board have granted permission to borrow £10,000 for the construction of the new Victoria sea-wall.

Our Office Table.

The sixteenth annual exhibition of pictures by members of the Yorkshire Union of Artists, and a display of works of applied art, was opened on Monday at the Leeds City Art Gallery, and will continue till January 2. The artists whose works are on view include Mr. A. Seord, Mr. Rowland H. Hill, Mr. P. Morton Teasdale, Mr. G. P. Carruthers, Mr. S. W. White, Mr. F. W. Jackson, Mr. F. Stead, and Mr. Brooke. Portraits and representations of Yorkshire scenery are prominent in the exhibition. There is a collection of water-colours in the east room, the contributors including Mr. J. D. Walker, Mr. W. Stephenson, Miss M. Wilson, Mr. H. S. Hopwood, Mr. A. W. Bayes, Mr. Rowland Hill, Mr. H. R. Oddy, Mr. John Sewden, Mr. W. E. Tisdall, Mr. Albert Kinsley, Miss Barran, Mr. J. W. Brooke, and Mr. F. W. Jackson. Arts and crafts specimens, jewelry, bookbinding, and Ruskin pottery are in the north room.

In connection with the Church Congress which is being held this week at Bristol, an ecclesiastical art exhibition has been opened at the Drill Hall in that city. It is the largest and most varied of the twenty-five annual collections of the kind brought together by Mr. John Hart. The Bishop, Dr. Forrest Browne, who will be remembered as a former Disney Professor of Archaeology at Cambridge, has lent several valuable exhibits, including a front of a chasuble (Italian) of about 1500; three pewter flagons used in mountain chapels in Switzerland and placed on charcoal braziers to prevent the wine and water from freezing; two copper gilt candlesticks; his pastoral staff, designed after an English example of about 1200, and a silver-gilt rosewater dish and ewer, presented to him on leaving Cambridge. The Dean and Chapter contribute a cope and mitre after an early 13th century design, and two unique silver candlesticks which, it is conjectured, belonged to a vessel in the Spanish fleet. The Lord Mayor and corporation have sent the Bristol insignia and plate. One of the swords is ascribed to the date 1373, and the donor of another was Sir John de Wells, Grocer and Mayor of London in 1431. During the Reform Riots in 1831 the rosewater basin was stolen by one James Ives and cut into 167 pieces. The theft was discovered by Mr. Williams, a silversmith of the city, who succeeded in fitting the pieces together, with the exception of two, which were lost, and Ives was transported for 14 years. The Duke of Beaufort sends four two-handled silver cups of 1698, and ancient dominoes found near Tintern Abbey. The Rev. E. J. Houghton, rector of St. Stephen's Bristol, lends a reliquary of St. Francis de Sales—a seal impression of Pius V., who excommunicated Queen Elizabeth, point lace of Charles I., and a gold and enamel locket of John Wesley. Church plate, silver crucifixes, embroidery, lace, and vestments of various periods are shown in great numbers.

An International Sanitary Conference was opened in Paris at the French Ministry of the Interior on Saturday by M. Delcassé, Foreign Minister, who alluded to the results obtained at the conference held in Venice in 1892, and added that experience had since shown the possibility of revising the rules then drawn up. That was the object of the present meeting. M. Barrère, French Ambassador to Italy, is presiding over the proceedings of the Conference, which will extend over several weeks. Its work has been divided into three heads:—(1) Revision of regulations enacted by preceding conferences and the introduction into them of such alterations as experience and the latest scientific discoveries have rendered possible in the interests of commerce and public health; (2) codification of all the regulations enacted by the preceding conferences and the present meeting; (3) measures for strengthening the control of health in Constantinople. The British delegates are Mr. De Bunsen, Dr. Theodore Thomson, of the Local Government Board, Mr. Frank Glenmore, and Mr. A. Alban, of Cairo. Dr. Ruffer represents Egypt.

The report of Mr. D. Joscelyne, late chief engineer and secretary, Public Works Department, to the Government of Bengal, the expert appointed by the Kent County Council to inquire as to the present system of main road management, is now in the hands of the members of that body. Mr. Joscelyne's investigations have extended over a year, and he sets forth the results

he has arrived at in a printed volume of upwards of 160 pages. His report is a trenchant criticism and condemnation of the present contract system. The method of preparing estimates is, he says, conducive to extravagance: the triennial system of contracts has failed: the practice of confining contracts for stone supply to one imported stone promotes monopolies and raises prices: the assurances of the county surveyor that the extended use of quartzite would be followed by diminished cost has proved illusory: the use of quartzite is absolutely condemned and a selection of basalts recommended: the supervision exercised is unequivocally pronounced to be defective; and much of the excessive wear and tear of the roads by traction-engine traffic is attributed to the system denounced. As to the working of the contract system, Mr. Joscelyne states that there are 28 districts, and in 1902-3, omitting 11 rural district councils, there were only 16 tenderers. A table of the accepted tenders for 12 years shows that the contracts have been shared during that period by eight firms, and, moreover, that by far the largest values go to the Road Maintenance Co. The published statistics are:—Road Maintenance Co. £179,788, Messrs. Tuff and Miskin £143,175, Messrs. J. Ellis and Co. £81,956, Messrs. Chittenden and Simmonds £78,878, Messrs. Arnold and Sons £77,088, Mr. Lambert £24,704, Messrs. Peill and Co. £19,836, Messrs. T. Wood and Sons £15,531. Mr. Joscelyne adds: "The contract system as applied to Kent means large profits for contractors at the expense of the ratepayers."

THE Strangers' Hall, at Norwich, a typical merchant's house of the end of the 15th century, situated between the churches of St. John Maddermarket and St. Gregory, which for fifty years had been allowed to fall into a sad state of dilapidation, and was finally threatened with demolition, was purchased in 1899 by Mr. Leonard Bolingbroke, by whom, after a year devoted to reparation, it was opened to the public, a small charge being made with the view of making the building self-supporting. The interest of the house, says a correspondent of the *Times*, has been greatly enhanced during the last three years by the collection within its walls of old household furniture and domestic appliances, so that it may illustrate, even in the most homely details, the life of the past. Beneath the west end of the hall is a fine crypt, of three bays, to the east of which are passages and other cellars. These cellars are probably the cellars of the house of Roger Herdegreve, burgess in Parliament in 1358, and bailiff of Norwich in 1360, which then stood upon this site. The kitchen and butteries, which are older than the rest of the building, may also have formed part of Herdegreve's house. The hall itself, with its groined entrance porch and oriel window, its kingpost roof and richly-moulded cornices and tiebeams, appears to have been built towards the close of the 15th century. The arrangement of the hall then was of the same nature as that of Haddon Hall, the screen crossing it at the eastern end, with a door in the south wall once leading into the garden, and two arched doorways in the east wall opening into the kitchen and butteries. A small portion of the original screen is still in position under the south end of the present gallery. The parlour, containing an open fireplace, is on the north side of the hall, and over it may have been a bed-chamber. Early in the 17th century the building was sold by the Sotherton family to Alderman Francis Cock, also a grocer, and in 1627 mayor of the city, who built out a room into the garden, and above it two other rooms, to give access to which he built in the hall a large oak bay window, and erected in it the existing Jacobean staircase and landing. At a later date this landing was extended across the end of the hall in a minstrel's gallery. The house afterwards came into the possession of Alderman Joseph Paine, who was appointed mayor in 1660, and knighted by Charles II. It was then that the doorway was made at the west end of the hall, leading, by a narrow staircase of oak with twisted balusters and carved brackets, to the west tenement, which was thus made an integral portion of the house. This western part of the building dates from Tudor times, and in Paine's day the lower front room was a Tudor apartment with a moulded oak ceiling. It is now panelled in the Georgian style, and the oak ceiling hidden from view by Georgian plaster, an alteration which may be attributed to the latter half of the 18th century, when the hall was in use as the Judge's lodgings.

Mr. WALTER RYE, F.S.A., has just published

a four-page sheet of some eight acts of vandalism which have recently been perpetrated in the city of Norwich. He illustrates his researches by a number of vigorous drawings, showing—1. The massive flint wall, probably 600 years old, fronting Bishopsgate-street, and inclosing the Lower Precinct. 2. The red-brick villas being erected in space that the wall shut in, all for £7 10s. per annum, and a hideous eyesore, says Mr. Rye. 3. A great piece of the interesting flint house in which the dean lives, recently cemented over by the dean. 4. A stretch of wall opposite St. Helen's Hospital, and used by the dean's tenant as an advertising station: and, comments Mr. Rye, "the dean of Norwich is a vice-president of the local archaeological society!" 5. A corrugated zinc fence, still abutting on the west front of the cathedral. 6. The cast-iron urinal on Tombland obscuring and defacing the grand Erpingham Gate. 7. The factory next St. Andrew's Church; and, finally, the hideous parti-coloured time-ball which breaks the line of the Norman Castle Keep.

THE West Riding County Council recently decided to divide the offices of county surveyor and architect, so long held by Mr. J. Vickers Edwards, and to appoint one official, who would be responsible solely for the inspection of highways and bridges, Mr. Vickers Edwards remaining the county architect. Mr. Fredk. George Carpenter, chief assistant in the surveyor's department, is to be the new surveyor of highways and bridges at a salary of £150 per annum, and Mr. Henry Moffatt Teasdale, one of the divisional highway surveyors, and Mr. J. U. R. Grave, assistant engineer in the highways and bridges department, will be appointed his assistants at salaries of £250 and £200 respectively. The new scheme will enable the county council to dispense with the services of the four divisional highway surveyors, whose salaries, including travelling expenses, amount to £1,000 per annum.

A REDISCOVERY, which cannot fail to have a wide interest for geologists, as well as architects and others interested in church building and church restoration, has recently been made in Weardale, county Durham. There are, says a correspondent, but few marbles in England suitable for the purpose of ecclesiastical edifices. In the southern districts Purbeck marble is the best known. In the North, Frosterley marble was in Medieval times the favourite, and extensive use was made of it at Durham Cathedral, for instance, in shafts, steps, &c. But for a considerable period Frosterley marble has been regarded as practically unobtainable. The energy and resources of the Pease family did, indeed, succeed in discovering a bed of it on their lands, and this has been turned to account in the Roman Catholic Cathedral at Norwich, and in various fonts and altar-tables. But then, again, the supply failed, and the marble was lost sight of except in very minor places. Quite recently, however, in working large limestone quarries, the Harehope Company were led by some indications in the bed of a mountain burn to make further explorations, with the result that a wide layer of the undoubted Frosterley marble was found bedded and buried in the limestone rock, quite 10ft. below the surface. The marble is black, rich in fossil corals, and very compact, and is said to be better calculated than Purbeck marble to bear great pressure and withstand atmospheric action. This arises from the fact that the fossils, imbedded in and forming part of the marble, are believed to owe their position and compactness to a salt-water formation, whereas in Purbeck marble the formation was due to the action of estuary or fresh water.

THE old Spread Eagle Hotel at Midhurst is being enlarged by adding to the hostelry two adjoining cottages. No alterations are being made to the main features of the buildings. The cottages are to be connected by a corridor with the hotel, the two rooms on the ground floor being used as dining and billiard rooms. Other alterations will be made in different parts of the house, and it is proposed to utilise the present billiard-room as a market or assembly room. In clearing out the cottages preparatory to fitting them for the reception of guests, some interesting discoveries have been made. In many of the beams, some 14in. square, which support the ceiling of the future billiard-room, there are numerous small holes in rows, and many were the guesses made as to the origin and uses of these till it was explained by Mr. Boxall, K.C., who visited the place recently, that they were relics of the time when the beams in question were used in

the old wooden walls of England. He said timbers marked in this way are a common feature of the wooded parts of the South of England, from whence many thousands of loads of timber were sent to the ship-building yards in days gone by. This practice made timber for building purposes scarce, and it was customary for the beams from old ships to be sent back to the district from which the shipwrights obtained their supplies; so it came about that numberless cottages contain a goodly proportion of ships' timbers amongst their woodwork. Behind a modern fireplace an old ingle nook with a seat on either side of the hearth has been discovered, and this will remain. In an attic were found over 200 panes of old-fashioned crown glass, each with the curious bottle feature in the centre, which can only be imitated but never equalled at the present day. This glass will be placed in the chief windows at the front and side of the dining and billiard rooms. The architect for the alterations is Mr. Falkingbridge Parker, of Coleman-street, E.C.

THE town councillors of Harrogate discussed on Monday the letting of the second contract for the new sewerage scheme. The sanitary committee recommended that the tender of Mr. Hampton Mathews (until last month a member of the council, but who resigned in consequence of tendering), amounting to £22,922, for No. 2 contract of the new sewerage scheme be accepted. A letter was read by Alderman Milner, stating that an item of £1,053 had been overlooked by Mr. Mathews in that tender. This would have brought Mr. Hampton Mathews's tender to £26,976. The next lowest tender was sent in by Mr. Richard Annakin, of Harrogate, amounting to £29,413. Alderman Fortune moved, as a matter of principle, that Mr. Mathews should not be allowed to amend his tender, as to do so would be most unjust to other contractors. Alderman Chippindale seconded. Dr. Solly moved an amendment that they permit that tender to be amended. It was a case in which the principle might be departed from. Mr. J. Houfe seconded, and thought they ought to consider the saving of £2,500 to the ratepayers. Alderman Simpson said he did not know a straighter man in Harrogate than Mr. Mathews, who, if he knew the feeling expressed, would not have the contract at any price. Dr. Solly withdrew his amendment, and Alderman Fortune's resolution was carried, and Mr. Richard Annakin's tender was accepted. Mr. Hampton Mathews's seat on the Bilton Ward was declared vacant, so that as a consequence of an error in casting up, Mr. Mathews has lost both his membership of the council and a substantial contract.

IN reply to the complaint by Messrs. Quayle and Ouvry, in a letter which appeared in our last issue, p. 477, as to the expensiveness of administration under the London Building Act, 1894, Mr. Henry Lovegrove, the hon. secretary to the District Surveyors' Association, writes: "The case described is very simple. There were not two surveyors. In the first instance the London County Council requested the district surveyor to report on the dangerous portico, for which he received from the Council the sum of £1 2s. 6d., and then, when the portico was rebuilt or repaired, the district surveyor became entitled to a fee of £1 16s. 3d., for seeing that the work had been properly carried out. The total fees of the surveyor amount to £2 18s. 9d., not a large amount for a man of experience, qualified by examination."

AT Hanley, on Monday, Oct. 12, a fire test of Uralite was carried out on ground adjoining the Grand Hotel (by kind permission of the manager) in the presence of a number of members of the North Staffordshire Institute of Mining and Mechanical Engineers, also borough surveyors, architects, and others. The test consisted of an ordinary partition, constructed of timber protected by Uralite slabs, against which a huge pile of wood soaked in petroleum was erected and set fire to. The temperature to which one side of this partition was subjected at times reached 1,850°, whilst the other side of the partition remained at atmospheric temperature. In the middle of this fire was also placed a deed box constructed of timber and Uralite. Inside this box paraffin wax, fusible metal, and sulphur, also a bundle of papers, were placed. The fire was afterwards extinguished, and the box opened, the contents examined and found unharmed, and the inside of the box was not even warm to the hand. The spectators expressed great satisfaction at the result, and predicted a great future for Uralite in

the Pottery district, where a fire-resisting building material is greatly needed for a variety of purposes.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY (TO-DAY).—Southern Counties Master Builders' Federation Half-Yearly Meeting, at the King's Rooms, Royal Pavilion, Brighton. 12.30 p.m.

MONDAY.—Liverpool Architectural Society. "Venice," by Peter Cowell, city librarian.

WEDNESDAY.—Architectural Association. Discussion Section. "Siena," by T. W. Bramwell, A.R.I.B.A., 56, Great Marlborough-street, W.C. 7.30 p.m.

THURSDAY.—Society of Architects. Nineteenth Annual Meeting. St. James's Hall, Piccadilly, W. 8 p.m.

Sheffield Society of Architects and Surveyors. "Elementary Notes on Building Supervision," by C. F. Innocent, A.R.I.B.A.

FRIDAY.—Glasgow Architectural Craftsmen's Society. "Reinforced Concrete," by A. Horne Morton and G. H. Gibson. 8 p.m.

The statue of the late Bishop Creighton, by Mr. Hamo Thornycroft, which is to be placed in St. Paul's Cathedral, is approaching completion, and will shortly be cast in bronze, which metal, on the suggestion of the artist and with the sanction of the memorial committee, has been substituted for marble.

Leeds new School of Art was opened on the 8th inst. by Mr. E. W. Beckett, M.P. The new school, which is situated at the corner of Vernon-street and Cookridge-street, has been erected at a cost of £12,000, and a sum of £2,000 has been spent in equipment.

A new Wesleyan church and schools, which have been built in Ashley-lane, Moston, in connection with the Manchester Victoria Circuit, were opened on the 8th inst. They take the place of older buildings, which had become inadequate. The work has been carried out at a cost of £7,600, including the value of the site.

The Department of Commerce and Industries of the New Zealand Government has arranged to send an experimental contingent of 50,000ft. of New Zealand timber to the Government authorities in South Africa.

The foundation-stone of the Church of St. Andrew, Chase Side, New Southgate, was laid on Wednesday week. Only the western section of the church is being built for the present, which will accommodate 300, and will cost £3,450. The completed building will provide accommodation for 734 persons.

Mr. J. Waldo Smith, M.Am.Soc.C.E., has been appointed chief engineer of the Croton Aqueduct Commission, New York, at a salary of 12,000dol. a year.

The corporation of Blackburn have opened a new electric tramway line from Witton to Cherry Tree. The new line was formally inspected last week by Major Druitt, R.E., and passed. The total length of the corporation lines is now fifteen miles.

The new corporation covered wholesale market, Wulfruna-street, Wolverhampton, which was opened last week, is erected entirely of local bricks relieved with terracotta facings, and is roofed with red tiles. The work has been carried out by Messrs. Cave, from the plans of Mr. Green, borough surveyor. The cost amounted to about £16,800.

At a meeting of Penrhyn quarrymen, held on Saturday, it was resolved by 152 votes to 72 to continue the strike.

The Board of Trade have recently confirmed the following orders made by the Light Railway Commissioners:—(1) Lavingham and Rosedale Light Railway (Extension of Time) Order, 1903, amending the Lavingham and Rosedale Light Railway Order, 1900; (2) Dartford District Light Railway Order, 1903, authorising the construction of light railways in Kent, 22 miles in length, from the Thames near Greenhithe to Dartford, and from Stone to Eynsford, with branches to Swanley Junction and to Stanstead.

Mr. Bicknell, Local Government Board inspector, held an inquiry at Thornhill, Yorks, on Friday, on an application made by the urban district council for power to borrow money to enable them to contribute towards the erection of a bridge over the Calder at Osett, to defray the cost of widening Slaithwaite Canal Bridge, and to pay for the widening of part of Savile-road, Savile Town. There was no opposition.

A company has been formed in Pennsylvania for the manufacture of slag cement, and a factory will soon be in operation. The International Cement Company will work under patents of Dr. Otto Wirth, of Philadelphia, the process consisting principally in the removal of the sulphur. The first cement is to be made from the slag of the Jones and Laughlin Steel Company.

Trade News.

WAGES MOVEMENTS.

SCOTTISH UNITED OPERATIVE MASONS' ASSOCIATION.—A joint general meeting of the local branches of the United Operative Masons' Association of Scotland was held in the Oddfellows' Hall, Edinburgh, on Friday night, Mr. W. Scott in the chair. Addresses on organisation work were delivered by Mr. G. B. Craig, central corresponding secretary, Glasgow, and Mr. Fraser, organising delegate. An effort is at present being made to increase the membership, and it was reported that within the previous fortnight about 160 members had been added to the rolls of the Central, West End, and Leith Branches. It was stated that when the members of the trade were thoroughly organised, steps would be taken to have the agreement with the employers renewed. The opinion was expressed that strikes should be avoided, and that everything should be done to continue the existing good relations between the masters and the men.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to £5 15 0	
Rolled-Steel Joists, English.....	6 10 0 " 6 12 6	
Wrought-Iron Girder Plates.....	7 0 0 " 7 5 0	
Bar Iron, good Stuffs.....	6 5 0 " 8 10 0	
Do., Lowmoor, Flat, Round, or Square.....	20 0 0 " 20 0 0	
Do., Welsh.....	5 15 0 " 5 17 6	
Boiler Plates, Iron—		
South Staffs.....	8 15 0 " 8 15 0	
Best Sneydhill.....	9 10 0 " 9 10 0	
Angles 10s., Tees 20s., per ton extra.		
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.		
Builders' Hoop Iron, galvanised, £12 to £13 per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£11 15 0 " £12 0 0	
Best ditto.....	12 5 0 " 12 10 0	
Cast-Iron Columns.....	£6 10 0 to £8 10 0	
Cast-Iron Stanchions.....	6 10 0 " 8 10 0	
Rolled-Iron Fencing Wire.....	8 0 0 " 8 5 0	
Rolled-Steel Fencing Wire.....	6 5 0 " 6 10 0	
Galvanised.....	7 15 0 " 8 0 0	
Cast-Iron Sash Weights.....	4 12 6 " 4 12 6	
Cut Glasp Nails, 3in. to 6in.....	9 5 0 " 9 5 0	
Cut Floor Brads.....	9 0 0 " 9 0 0	

Wire Nails (Points de Paris) —	Per ton.
6 to 7 8 9 10 11 12 13 14 15 B.W.G.	
8/- 8/6 9/- 9/6 9/9 10/6 11/3 12/- 13/- per cwt.	
Cast-Iron Socket Pipes—	
3in. diameter.....	£5 15 0 to £6 0 0
4in. to 6in.....	5 12 6 " 5 17 6
7in. to 24in. (all sizes).....	5 7 6 " 5 10 0
[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 0d. per ton extra.]	

Pig Iron—	Per ton.
Cold Blast, Lilleshall.....	105s. 0d. to 112s. 6d.
Hot Blast, ditto.....	65s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—	Per p.c.
Gas-Tubes.....	67½
Water-Tubes.....	62½
Steam-Tubes.....	57½
Galvanised Gas-Tubes.....	55
Galvanised Water-Tubes.....	50
Galvanised Steam-Tubes.....	45

	10cwt. casks.	5cwt. casks.
Per ton.	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0 to £24 10 0	
Do., Vieille Montagne.....	26 5 0 " 26 15 0	
Sheet Lead, 3lb. and upwards.....	13 12 6 " 13 12 6	
Lead Water Pipe (F.O.R. Lond.).....	14 2 6 " 14 2 6	
Lead Barrel Pipe.....	15 2 6 " 15 2 6	
Lead Pipe, Tinned inside.....	16 2 6 " 16 2 6	
Do., and outside.....	17 12 6 " 17 12 6	
Composition Gas-Pipe.....	16 2 6 " 16 2 6	
Soil-Pipe (5in. and 6in. extra).....	16 2 6 " 16 2 6	
Pig Lead, in test. pigs.....	10 16 3 " 10 17 6	
Lead Shot, in 28lb. bags.....	15 0 0 " 15 5 0	
Copper Sheets, sheathing and rods.....	71 0 0 " 71 5 0	
Copper, British Cake and Ingots.....	58 0 0 " 58 10 0	
Tin, Straits.....	114 5 0 " 114 15 0	
Do., English Ingots.....	118 0 0 " 118 5 0	
Spelter, Silesian.....	20 12 6 " 20 15 0	

TIMBER.

	per load	£10	0 0	to	£18	0 0
Teak, Burmah.....		9 15 0 " 16 0 0				
" Bangkok.....		3 12 6 " 6 5 0				
Quebec Pine, yellow.....		4 12 6 " 7 10 0				
" Oak.....		5 0 0 " 10 0 0				
" Elm.....		4 7 6 " 9 0 0				
" Ash.....		4 12 6 " 8 5 0				
Danish and Memel Oak.....		2 12 6 " 6 10 0				
Elm.....		3 2 6 " 5 10 0				
Wainscot, Riga p. log.....		2 7 6 " 5 5 0				
Lath, Danzig, p.....		4 0 0 " 6 0 0				
St. Petersburg.....		4 0 0 " 6 0 0				
Greenheart.....		7 15 0 " 8 0 0				
Box.....		7 0 0 " 15 0 0				
Sequoia, U.S.A., per cub. foot		0 3 6 " 0 3 9				
Mahogany, Cuba, per super foot		0 0 6 " 0 0 8				
1in. thick.....		0 0 6 " 0 0 7½				
" Honduras.....		0 0 4 " 0 0 5				
" Mexican.....		0 0 4 " 0 0 5				
" African.....		0 0 3½ " 0 0 5½				

Cedar, Cuba.....	per super foot	£1 0 3 to £1 0 3½	
" Honduras.....	"	0 0 3½ " 0 0 3½	
Satinwood.....	"	0 0 10 " 0 1 9	
Walnut, Italian.....	"	0 0 3 " 0 0 7½	
" American (logs).....	"	0 8 1 " 0 8 1	

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 1½in. :—

Quebec, Pine, 1st.....	£22 0 0 to £29 5 0	
" 2nd.....	18 5 0 " 23 10 0	
" 3rd.....	11 15 0 " 14 0 0	
Canada Spruce, 1st.....	11 10 0 " 15 5 0	
" 2nd and 3rd.....	8 10 0 " 10 0 0	
New Brunswick.....	8 0 0 " 9 10 0	
Riga.....	7 10 0 " 8 5 0	
St. Petersburg.....	8 10 0 " 16 10 0	
Swedish.....	11 10 0 " 19 10 0	
Finland.....	9 0 0 " 10 5 0	
White Sea.....	12 0 0 " 19 10 0	
Battens, all sorts.....	6 10 0 " 14 0 0	
Flooring Boards, per square of 1in. :—		
1st prepared.....	£0 13 6 " £0 19 0	
2nd ditto.....	0 12 0 " 0 16 0	
Other qualities.....	0 6 0 " 0 14 0	
Staves, per standard M :—		
U.S., pipe.....	£37 10 0 " £45 0 0	
Memel, cr. pipe.....	220 0 0 " 230 0 0	
Memel, brack.....	190 0 0 " 200 0 0	

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 3	
Red Mansfield ditto.....	"	0 2 4½	
Hard York ditto.....	"	0 2 10	
Ditto ditto 6in. sawn both sides, landings, random sizes.....	per foot sup.	0 2 8	
Ditto ditto 3in. slabs sawn two sides, random sizes.....	"	£0 1 3	

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations.....	per foot cube	£0 1 0	
Delivered on road waggons, Paddington Depot.....	"	0 1 6½	
Ditto ditto Nine Elms Depot.....	"	0 1 8½	

Portland Stone, in random blocks of 20ft. average :—

Brown.....	per foot cube	£0 1 5½	£0 1 7½
White Bed. Base Bed.			
Delivered to railway depot at the quarry.....	per foot cube	£0 1 5½	£0 1 7½
Delivered on road waggons at Paddington Depot.....	"	0 2 1	0 2 2½
Ditto Nine Elms Depot.....	"	0 2 1	0 2 2½
Ditto Pimlico Wharf.....	"	0 2 1	0 2 2½

FEYRE AND CO.

Blocks Palotte Banc Franc.....	1 5	per c ft. ex.	
Ditto ditto Banc Royal.....	1 3	do. do.	
Ditto Enville.....	1 9	do. do.	
Ditto Comblanchieu.....	3 0	do. do.	
Ditto Massagris (Roche).....	2 6	do. do.	

OILS.

Linseed.....	per tun	£18 10 0 to £18 17 6	
Rapeseed, English pale.....	"	23 5 0 " 23 10 0	
Do., brown.....	"	22 5 0 " 22 15 0	
Cottonseed, refined.....	"	31 0 0 " 32 0 0	
Olive, Spanish.....	"	32 0 0 " 32 0 0	
Seal, pale.....	"	26 0 0 " 29 0 0	
Cocunut, Ceylon.....	"	30 0 0 " 31 0 0	
Do., Ceylon.....	"	25 0 0 " 26 0 0	
Palm, Lagos.....	"	28 0 0 " 28 10 0	
Oleum U.S.....	"	17 5 0 " 19 5 0	
Lubricating U.S.....	per gal.	0 7 0 " 0 8 0	
Petroleum, refined.....	"	0 0 5½ " 0 0 6	
Tar, Stockholm.....	per barrel	1 6 0 " 1 6 0	
Do., Archangel.....	"	9 19 6 " 1 0 0	
Turpentine, American.....	per tun	37 0 0 " 37 5 0	

The fine peal of twelve bells belonging to St. Mary Redcliff, Bristol, have just been rehung by Messrs. J. Taylor and Sons, of Loughborough, and were rededicated on Saturday.

Mr. Thomas Blockage, of Dewnap House, Dukinfield, died on Friday. Deceased was 76 years of age, and was the founder of the firm of Blockage and Sons, tile manufacturers, of Birch-lane, Dukinfield.

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LIST OF COMPETITIONS OPEN.

Bedlington—Corrugated Iron Fever Hospital	C. Browne, Surveyor, Bedlington	Oct. 17
Harrogate—Pump-Room and Colonnade in Valley Gardens	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	26
Skewen—Public Library (limit £2,000)	Samuel Jones, Clerk, Old-road, Skewen, Neath	Nov. 9
Kilmarnock—Tenement of Shops and Workmen's Houses	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	9
Sunderland—Additions to Town Hall	John W. Moneur, A.M.I.C.E., Borough Engineer, Sunderland	21
Wakefield—Reconstructing Cattle Market	R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Herne Hill, S.E.—Public Library	H. J. Smith, Clerk, Lambeth Town Hall, Kennington Green, S.E.	16
Vienna—Machinery to Lift Boats	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Glasgow—Branch Library for Parkhead District	Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	—
Liverpool—Cotton Exchange (Local Architects)	Peter Brown, Sec., 5, Brown's Buildings, Liverpool	—
Oldham—Board School	J. Rennie, Clerk, School Board Offices, Oldham	—
Llwynypia—Workmen's Hall (1,500 seats)	The Secretary, Workmen's Institute, Llwynypia, Wales	—

LIST OF TENDERS OPEN.

BUILDINGS.

Barrow-in-Furness—Store-Shed at Cambridge-street School	Education Committee	Oct. 17
Middleton—Rebuilding Two Chimney Shafts in Workhouse	Guardians	17
Peables—New Gasworks, Eschels	Town Council	17
Dunbar—Additions to West Bams School	School Board	17
Neyland—Additions to Baptist Chapel, Little Honeyborough	Thomas Leathes Exors	17
Embleton—Buildings at Low Netherlands	Education Committee	17
Barrow-in-Furness—Removal and Re-erection of Iron School	Cornforth United Social Club	17
West Cornforth—Additions to Premises	S. L. Jones	17
Resolven—Twenty Houses at Melincourt	Great Northern (Ireland) Ry. Co.	17
Dewsbury—Warehouse, Bradford and Wood-streets	Metropolitan Railway Co.	17
Hamilton-bawn—Stationmaster's House	Markets Committee	17
Neasden, N.W.—Repairing Shed	Great Northern (Ireland) Ry. Co.	17
Kinsale—Methodist Manse	Metropolitan Railway Co.	17
Leeds—Stalls in new Market Hall	Markets Committee	17
Malabide—Station Building	Great Northern (Ireland) Ry. Co.	17
Acton—Engine-Shed at Old Oak Common	Great Western Railway Co.	17
Bradford—District Baths, Wakefield-road	Corporation	17
Minera—Miner's House	Great Northern (Ireland) Ry. Co.	17
Gorachwood—Stationmaster's House	Bucks County Council	17
Slough—Court-Room	Guardians	17
Paddington, W.—Boiler-House at Harrow-road Workhouse	Industrial Co-operative Society	17
Ashington—Additions to Bakery Department	Corporation	17
Rochester—Additions to Corn Exchange	Electricity Committee	17
Kilmarnock—Generating Station	Mining Schools Committee	17
Pudsey—Pair of Semi-Detached Houses	Jackson and Son	17
Canborne—Students' Club	Education Committee	17
Sedburgh—Enlarging Premises	Corporation	17
Bristol—School, Air Balloon-hill, St. George	Tramways Committee	17
Hereford—Shedding at Cattle Market	Admiralty	17
Prestwich—Seven detached Cottages, Dashwood-road	Education Committee	17
Huddersfield—Mill Chimney, Globe Works	Corporation	17
Leicester—Two District Car-Sheds	Gas Committee	17
Sheffield—Shops and Dwellings, Gibraltar-street	Urban District Council	17
St. Govan's Head—Coastguard Buildings	School Board	17
Portsmouth—School	T. Wilkinson	17
Stofield—Villa	Guardians	17
Bexhill—Coronation Clock Tower, West Parade	London County Council	17
Leeds—Concrete Foundations for Purifiers	Standing Joint Committee	17
Antrim—Alterations to First Presbyterian Church	Tramways Committee	17
Ilford—Depot, &c., Ley-street	London County Council	17
Cardiff—Schools (1,200 places), Llanishen-street	Westminster City Council	17
Darfield—Nine Houses	Wm. Conway and Sons, Ltd.	17
Bradford—Hospital Pavilion at Workhouse, Horton-lane	H.M. Commissioners of Works	17
Nine Elms, N.W.—Lennon Buildings	Corporation	17
Portland—Additions to Police Station	Library Committee	17
Bury, Lancs—Re-erecting Shop	Guardians	17
Hackney, N.E.—Vallette Buildings	Board of Guardians	17
Pontygnath—Additions to Working-Men's Institute	Mather Bros.	17
London, S.W.—Reconstructing Slipper Baths, Marshall-st.	Midland Railway Co.	17
Halifax—Warehouse and Shops, Bull Green	Burial Board	17
Islington—Superstructure of Postal Stores	Burial Board	17
Pontygnath—Rebuilding Castle Inn	Guardians	17
Hull—Beverley-road Baths	Town Council	17
Bristol—Central Library, Deanery-road	Education Committee	17
Clonmel—Methodist Church and Manse	Wangford Guardians	17
St. Columb Minor—Wesleyan Church	Guardians	17
Willesden, N.W.—Ward Block at Workhouse Infirmary	Metropolitan Asylums Board	17
Limerick—Laundry, Chimney Shaft, &c., at Workhouse	Tramways Committee	17
Gateshead—Additions to Premises, West-street	Corporation	17
Stanningley—Workshop	Corporation	17
Harrogate—Additions to Claremont Hotel	London County Council	17
Newhaven—Post-Office	Corporation	17
Cardigan—Rebuilding Premises	Guardians	17
Sheffield—Fifty Workmen's Cottages	Town Council	17
Harrogate—Additions to New Inn	Education Committee	17
Bradford—House, &c., Canal-road	Wm. Conway and Sons, Ltd.	17
Pinner—Mortuary Building	H.M. Commissioners of Works	17
Newhaven—Altering Primitive Methodist Chapel	Corporation	17
Knaresborough—Two Semi-Detached Houses	Library Committee	17
Pinner—Restoration of Chapels	Guardians	17

ELECTRICAL PLANT.

Bridgend—Installation of Electric Light at Workhouse	Guardians	Oct. 17
Harrismith—Electrical Machinery	Town Council	17
London, W.—Telegraph Instruments and Apparatus	Great Western Railway Co.	17
Salford—Wiring Central Car Depot	Tramways Committee	17
Aberdeen—Electric Light Wiring at New Poorhouse	City Parish Council	17
London, W.—Electric Lamps	Great Western Railway Co.	17
Johannesburg—Plant	Municipal Council	17
Leeds—Electric Lift at Market Hall	Markets Committee	17
Nelson—Engine and Dynamo	Corporation	17
London, W.—Electric Lighting Sundries	Metropolitan Railway Co.	17
Halifax—Dynamo	Tramway Committee	17
Halifax—Cables, &c.	Tramway Committee	17
Todmorden—Plant	Corporation	17
Swansea—Ducts, &c.	Corporation	17
West Ham—Wiring Abbey Mills Pumping Station	London County Council	17
Kilmarnock—Plant	Corporation	17
Dudley—Electric Power and Light Installation at Workhouse	Guardians	17

ENGINEERING.

Peables—Gasholder	Town Council	Oct. 17
Bristol—Heating and Ventilating Schools	Education Committee	17
Shipmeadow—Soft-Water Tank at Workhouse	Wangford Guardians	17
Warwick—Weighbridge	Guardians	17
Blackwall, E.—Repairing Dolphins at North Wall Pier	Metropolitan Asylums Board	17
Salford—Machinery at Central Car Depot	Tramways Committee	17
London, E.—Roof over Wharf at Royal Victoria Dock	Great Western Railway Council	17
Wm. Buchan, Town Clerk, Peables	Wm. Buchan, Town Clerk, Peables	Oct. 17
Holbrow and Oaten, Architects, 9, Clare-street, Bristol	Holbrow and Oaten, Architects, 9, Clare-street, Bristol	17
F. S. Rix, Clerk, Beccles	F. S. Rix, Clerk, Beccles	17
F. P. Trepess, F.I.A.S., 11, Church-street, Warwick	F. P. Trepess, F.I.A.S., 11, Church-street, Warwick	17
T. Duncombe Mann, Clerk, Embankment, E.C.	T. Duncombe Mann, Clerk, Embankment, E.C.	17
The General Manager, 32, Blackfriars-street, Salford	The General Manager, 32, Blackfriars-street, Salford	17
G. K. Mills, Secretary, Paddington Station, W.	G. K. Mills, Secretary, Paddington Station, W.	17

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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THE MODERN PRACTITIONER.

IN his double capacity of designing buildings and carrying them into execution, the architectural practitioner is often misunderstood. There are those who blame him for inattention to business matters, for ignorance of law, for excessive cost of building; there are others who make him equally responsible for any defect in the building, structural or artistic. He has to serve two masters—his client, who expects a good deal from him in matters of business, and his own artistic conscience, if he has any, or that more enlightened and appreciative public who are always ready to criticise. This dual capacity has not been taken into full account by those who are inclined to sum up the architect's qualifications according to an academical standard, or to some mode of practice that once existed. During the last week or two the requirements of the profession have been discussed, and it is beginning to dawn on those who would improve the status of the profession that the architect's position must be discussed in relation to his practical duties as well as to his art training. The Manchester School of Architecture, according to the address we gave last week of the President of the Manchester Society of Architects to the society, is amongst those who take this view. Practical work cannot be placed on the same basis as theory, which can be tested in the ordinary way by school training and examination; and it is this conclusion that has to be faced.

The professional practitioner is a very variable individual, a fact which is easily explained when we consider that we all approach the vocation of architecture through a more or less varied experience, and that our faculties vary much. There are those who have been brought up in the severe and rigid circumstances of a limited practice, who have only had the experience of assisting in the erection of the plainest buildings of the most ordinary kind, or of being brought up in the office of a building surveyor or builder in a country town; while others have breathed a very different atmosphere, have had the advantage of early training in the offices of large firms, whose practice has been varied and of a superior character, or have been in the offices of leading London architects. So that it is quite impossible to gauge a man's capabilities or to say how much in him is due to natural talent, and how much to early training. A great many of those whose earlier life and circumstances have been the most restricted, have by personal ability or dint of energy achieved a higher place in the profession than many who have enjoyed more favourable surroundings and a better education. We see many such cases; it is an everyday experience;—men who have been articled in the best offices are in a few years found in subordinate positions, often from no fault of their own, but that they have been less fortunate in the chances of life. Others less well placed succeed. Sometimes it is a rich patron who has come along at the right moment, and has given a helping hand, or it may be success in a big competition that has put the young man on his feet. Education does not count for much amid these changes and chances; various other forces must be considered—energy, good fortune, tact. If the most perfect system of architectural education were devised, and every young man entering the profession had to pass a qualifying examination before he could practise, we should find the same variation existing.

Each practitioner might have an equal start; but in a few years we should still see the inequalities and variations, the results of various conditions, mental and moral. It would be the same as placing each man on the same level financially at the start: in a few years we should see the same irregular line; some well off who had amassed wealth, others poor, indicating differences of physical, mental, and social advance. Some would be leading, others lagging far behind.

A qualification test for practice would, of course, relate to a knowledge of statutory law, like Building Acts, legal questions concerning the rights and liabilities of building owners, valuation of property, and various other matters affecting individuals and property, absolutely essential to the profession, though it would not test those personal faculties of tact and perseverance upon which success chiefly depends. It would prevent the unqualified and incompetent man setting up in practice; but it would do nothing to prevent the tactful and even unscrupulous practitioner from getting to the front and ousting better men than himself; so that an examination test will not guarantee the most desirable man in every instance. But it would do something towards promoting uniformity of practice. The knowledge of legal principles, of the rights and liabilities of building and adjoining owners, of the law of easements, would render it impossible for any professional man to take up a position that is indefensible, or to commit his client to a line of action that cannot be sustained. We should hear less of mistakes about the requirements of Building Acts, of the rights of owners in respect of light and air, of support which entail loss on clients. These are undoubted advantages of a professional test. Practitioners may broadly be divided into those who are men of business and those who are men of art. The former must be a man of action. He must not only think, but he must act. In receiving instructions to design and erect a building he ought to be able to put his ideas into a practical form, to draw out the wishes of his client, to enter into his requirements and tastes, be ready to meet any emergencies, and to anticipate objections, and the better prepared he is for this task the greater will be his success. Unfortunately, many of those who enter the profession have not this double gift. They give an opinion that is not supported by fact, or that may do in one set of circumstances but is quite inadequate in the particular case. This may not only apply to the design of a building, but also to the conduct of the work, in the supervision. For example, we are constantly hearing of plans being prepared for a special building which fail to pass the local municipal authority, the Local Government Board, or the Board of Education requirements, showing a want of preparation or knowledge of codes. In matters of superintendence a lack of caution or foresight often renders the architect or his client liable for some neglect as to support of the adjoining premises by shoring or extra foundations, for neglect to ascertain the right of acquired light to the premises of the dominant owner, or for some other infringement in building which ought to have been found out. Probably it is only experience that will enable an architect to act. He has learned to anticipate these difficulties and contingencies, and to prepare for them. Examination alone will not give him this intuition—no doubt a strong reason why the old system of pupilage is so valuable. Practical acquaintance with building operations is the only way in which the young architect can learn these matters. How many of the younger men in the profession in the first contracts they have to carry out discover one after the other these hindrances and opposition—matters about which they had not the faintest conception, such as the obstacles in getting their plans passed, local

regulations which require a considerable alteration of the plans, opposition of adjoining owners, the demands of litigious contractors for orders for extras, troublesome traders, &c. He finds his theories and assumed knowledge of his profession all leave him; they are of no use to him in these difficulties which crop up during the progress of the work. Circumstances arise which render his drawings or details useless; his specification requirements are disputed or called into question by the contractor, or his contract, on which he prided himself as being impregnable, is found out to be open to attack. What he has learned in books and classes about stone and timber or construction he finds of very little help when he is confronted with actual facts, materials, and building operatives, who look at them in a different way. There is nothing in common between the book theory, or terms used in the school, and those which the builder or tradesman uses. In short, he finds it necessary in the course of time to learn his business over again, and to adopt the practical phraseology of the workshop. On the whole, it must be confessed that the practical part of the architect's vocation—the business and active portion—is becoming more complex and intricate every day, and while a great deal can be learned in the architectural schools and the day classes of the Association, a great deal more will depend on the student himself, his natural aptitude and energy. The right direction of study is one of the main things that the schools ought to teach. A great many in the profession go about their work in the wrong way. Instead of taking a little trouble to understand their client's requirements, his trade or his habits, they distract his attention with designs of buildings they have executed, with suggestive schemes which have little reference to the actual wants. The client, if he does not know, selects a design which turns out a failure, or if he does know what he wants, feels disgusted, and abandons the whole. In other cases the practitioner plays into the hands of builders or other tradesmen who have an interest in the work, and compromises himself. Some consult their own pockets by increasing the expenses, adding to the ornament of the building, proposing designs for subsidiary things, like decoration, fittings, or ironwork of a costly kind, which increase the cost unnecessarily. In questions of law, contracts, dealings, with builders and committees, the necessity of dealing and acting rightly and promptly can only be acquired by knowledge of the point at issue. In matters of design the client may insist on a course which the architect knows is prejudicial; it is the duty of the professional man to advise, not to give in too complacently to the client's wishes. To yield in matters of plan may lead to serious mistakes and re-cremations afterwards. In questions of design the architect may easily forsake his duty under the idea of pleasing his client and bring reproach upon himself. Sometimes, as in the case of a shop, the business requirements of his employer may demand a large plate-glass window quite out of keeping with the upper part of the elevation, and the architect finds it hard to reconcile his artistic conscience with the suggestion. Yet he should not waver in his opinion, and he is justified in doing all he can to dissuade his client from a course that will not redound to his credit as an architect. But this is a matter which belongs more to the second part of our subject—the practitioner as a man of art. A decisive opinion on any point and promptness of action will save many a situation, where a *laissez faire* policy would be ruinous in business transactions. But decision of opinion implies a previous judgment based on facts—so hard to acquire by men of little experience. We have known men in the profession who are too ready to accept the dicta of their clients

in, say, questions relating to the value of property or compensations to be paid for damages, ancient-light cases, &c. Such men adopt the position of special pleaders, and stick to a certain opinion without independent investigation. They think it is their duty to side with one party against the other, whether right or wrong. Of course, it is a professional man's duty to discover the strong points of his client's position, and to defend them to the best of his ability. He must certainly fight for his client's interest; but this does not necessarily mean that he must stick up for a hopeless cause, or try to defend a wrong position. It should be his duty to point out to his client the right course to pursue, to discover the legal claims, if any, his client has, and not to hesitate to inform his client of the hopelessness of his case if need be. Such a course of action is, we are afraid, not generally pursued. If it is a compensation case for damage to property, the professional man is prone to think that his duty requires him to exaggerate the amount, to defend a valuation that is excessive, to adopt means, however indefensible, to secure success, such as calling professional witnesses of doubtful reputation; or, if he is engaged to prove obstruction of light, he is apt to go to great lengths in magnifying the obstruction, and to call witnesses to prove the substantial deprivation of light. In this desire to "go the whole hog"—to use a common phrase—the professional man loses the confidence of his client. An old adage says "Discretion is the better part of valour." Before acting it is necessary to be sure; no cause has been advanced by precipitate partisan action.

In the supervision of buildings the professional man's qualifications are fully tested. In no other position is the double capacity to know what is correct and proper and how to act with discretion and tact more desirable. A thorough knowledge of building construction must be accompanied by a sound, common-sense capacity, which it would be impossible to gauge by any examination test. As an example, we may imagine some alteration is necessary in a building. The drawings show one method, the circumstances of the case suggest another mode of construction. The architect must be able to devise a new system of construction; it may require the use of another material. Here the practitioner's skill as a constructor is put to a practical test: he has to bring into requisition his knowledge as well as his capabilities as a superintendent, which call for ready perception and tactical skill in dealing with the builder. Again, an alteration in a contract involves several business transactions between employer and contractor, in which a knowledge of contract law and the conditions of contract becomes necessary. The value of any such alterations has to be determined by measure and value, the amount of which has to be settled by the architect. These transactions cannot be easily made the subject of examination.

The other side of our question, the practitioner as a man of art, involves the question how far it is practicable to combine the business with the art side of the profession. We do not discuss that point now. There have been several notable instances of architects rising to a considerable position in the profession, who have been good men of business. To affirm that the two things are incompatible is simply to assert that a majority of the best architects are not qualified by nature to make good business men. Their training and their habits of thought are so unlike. Much may be done by the method of training and instruction the young man receives while serving his terms of articleship; but a great deal more is the result of the pupil's own aptitude and natural capacity in this direction. One pupil will direct his attention to transactions

between the master and the builder. He will take an interest in the letters which pass between the architect and client or contractor, the issue of certificates, reports, and valuations which it may be his duty to copy, while another student in the same office may be quite oblivious to these transactions in his eagerness to make drawings. The first of these will make a good business man; he is all-observant of what passes, and is ready to discuss any matter of business, while the latter turns a deaf ear to all that concerns external routine in his love for artistic work. The Manchester Society of Architects have, according to Mr. W. J. Beaumont, its president, declared in favour of the registration of the profession. As he truly said, "No form of registration would suffice to suppress 'quacks,' but it would enable the public to discriminate between qualified and unqualified architects." Both the business practitioner and the art architect would benefit by a little of each other's skill, and by the exclusion of men who, whatever their ability, have no qualification to practise in the true sense of the term.

REPORT OF THE FIRE PREVENTION CONGRESS.

THE Official Report of the International Fire Prevention Congress, instituted by the British Fire Prevention Committee, has been issued, and contains many valuable suggestions and resolutions to which we may now draw attention. The Congress held on July last discussed many useful problems, and several papers were read, of which our columns have contained reports. The publication before us is a rather bulky volume, and has been entrusted to the *Public Health Engineer*, the editor of which journal refers to the considerable difficulty entailed in reporting a congress at which three languages were in constant use. Mr. Edwin O. Sachs, the Chairman of the British Fire Prevention Committee, writes an introduction, in which he recapitulates several features of this congress;—the first that it was the first one of its kind; that fire protection comprises both fire prevention and fire fighting; and that although fire brigade tournaments have been held for the exchange of experiences, such as those at Amsterdam and Berlin, this was the first conference in which fire prevention measures have been considered as distinct from fire-extinguishing equipment. All the professions interested, including architects, engineers, surveyors, municipal officials, &c., have joined with professional fire brigade chiefs and officers in the discussion. Mr. Sachs also points out that among the most notable expressions of opinion by members is that which calls for the abolition of the term "fireproof" as applied to building construction. That the more correct term "fire-resisting" should be used instead has been acknowledged for many years by all who have written on the subject. We have invariably adopted the latter term as being more consistent with facts. The suggestion that a classification of degrees of "fire resistance" should be adopted is also desirable. The standards proposed by the British Fire Prevention Committee, to which we lately referred, seem to be good ones. They are (1) temporary protection, (2) partial protection, (3) full protection, in accordance with a schedule. All building materials and systems of construction to be classified under these heads. The first implies resistance against fire for at least three-quarters of an hour; that "partial" protection implies resistance against a fierce fire for at least one hour and a half, and that "full protection" implies resistance against a fierce fire for at least two hours and a half. These standards for fire-resisting floors and ceilings, partitions and single doors, are fixed in tables to which we shall refer. Another point to which attention is called is the desirability of revising the building laws in most countries to make them accord with the most recent experience.

We confine our attention mainly to that part of the report which deals with building construction and equipment—Section I. of the congress, presided over by many eminent foreign and English architects and engineers. The opening address of the chairman of the British Fire Prevention Committee (Mr. Edwin O. Sachs) contains a brief *résumé* of the scope of the

congress and the objects in view. These were, mainly to consider the practice of building construction and the application of materials from a fire prevention point of view, comprising the practice in different countries, and inquiring into the latest materials and systems of construction; to consider the equipment of buildings, particularly in relation to the application of electric power and lighting; to consider the development of automatic electrical fire alarm systems; to consider the legislative enactments in force in respect to the limitation of area or cubical contents of warehouse buildings and workshops, and the means of separating such buildings, the means of escape in case of fire, the construction and regulation of theatres and places of resort, and the means of escape in case of fire in shops and tenements, the best means of watching or inspecting buildings exposed to fire risks, &c. Many subjects are raised in this address, some of which we have already noticed. Thus the suggestion that municipal bodies should make building regulations retrospective, and that owners should have ample time to make the necessary improvements; that instruction in fire-prevention should be given in elementary schools in the form of tables and copy-book headings; that the regulations in force for theatres or factories may be extended to public schools—the sad experience of the Eton school is noticed in this connection. It is true, the housing accommodation of many large schools would not be tolerated in a common lodging-house. The increasing risks due to electrical plant, high-tension systems, arising from inexperienced plumbers and gasmen who have done the work, is another subject for legislative action. The insurance companies can exercise influence in preventing fire by encouraging better building. The value of what is known as "fire geography or topography"—the study of localities which have structural risks, and dangers arising from the contents of the buildings, is a very necessary step. All fire-brigade officers should be informed as to these localities. These are a few of the points that have been discussed. Several papers of interest follow, as that of Dr. Edward Atkinson, President of the Boston Manufacturers' Mutual Fire Insurance Co., which we reported, on the Prevention of Loss by Fire in the United States. He speaks of the old Colonial type of house as leaving nothing to be desired, and contrasts them with the crazy roofs and bad imitations of more recent European styles which have infested the States. These modern structures owe their risks to the cutting up of solid timbers into planks and joists, which have been put together in what is known as "basket" framing leading to a cellular type of structure of the most risky class. After discussion, a resolution was passed by the Congress to the effect that the Factory Mutual Insurance system, as adopted in the United States, materially tends to the prevention of fire and the reduction of fire waste, which was unanimously carried. Another paper on "Building Construction from a Fire Brigade Officer's Point of View," by Mr. Arthur Pordage, firemaster of Edinburgh, dwells on several matters which are a source of danger, though intended as safeguards. Amongst these are mentioned iron, concrete, and stone as being subject to the laws of expansion and contraction, and therefore not fireproof, though so termed in Acts of Parliament. Those which are not subject to these laws, and have withstood fire, are timber, bricks, mortar, and good plaster. The author describes various systems of construction which the ordinary fireman has found to withstand the effect of fire for a considerable time. These include ordinary wood joists with plaster ceiling, having thick floor boards tongued together, and the joists pugged between, brick partitions continued through the building, solid hardwood stairs instead of concrete or stone, the treads filled with "deafening," and plastered underneath. In the discussion, M. G. de Marie, of the Luxembourg Fire Brigades Federation, suggested as the best stairs those made of brick instead of wood. Mr. A. Darbyshire, F.S.A., agreed with Mr. Pordage as to stairs for domestic buildings, but for all public buildings—such as theatres, stores, mills, &c., he preferred concrete stairs in a newelled space. There is much in the discussion on this paper worth notice; but we have already given the gist. J. Stübgen, late city architect Cologne, contributes a paper on "Urban Fire Protection as Influenced by Street Planning and Building Regulations." The author refers to the Russian by-law which regulates the official plan of a city, and make

arrangements for the easy access to buildings by the fire brigade. A width of from 90ft. to 150ft. is provided for new estates, for the main thoroughfares, the blocks being divided by narrower minor streets in no case less than 10 metres—i.e., 32ft. 6in. The local building by-laws of German States take into consideration several points. (1) Access to a fire; (2) circulation at a fire; (3) prevention of an outbreak; (4) prevention of the spread of fire; (5) saving of life. These are severally discussed. With regard to the second point, the regulations provide for suitable approaches, areas, and staircases, an area must be planned in ratio to the area of building, also to its height. In Berlin the smallest area is 6 metres, in the suburbs 15 metres. The ratio of area of courtyard to total area of building site varies from 12½ per cent. for a corner building at Carlsruhe to 70 per cent. in the Berlin suburbs. Staircases have, it appears, a minimum width of 90 centimetres, or just under 3ft. In large tenement houses the top staircase is 1 metre (3ft. 3in.), and an additional 15 centimetres added for every floor downwards. Two staircases are required for an area exceeding 150 square metres, and so on, and no living room is to be further than 20 metres (65ft.) from any staircase. This is the rule in Cologne. A paper on "Modern Warehouses and Sheds in the Hansa City of Hamburg," by Chief Officer Westphalen, Hamburg, gives some useful remarks, with plans and sections of warehouses at Hamburg Dock, plans and views of Entrepôt Royal, Antwerp, showing the courtyards between blocks and the stairs and galleries, and details of roller shutters. The paper by Max Clarke, A.R.I.B.A., on "How to Make Existing London Buildings Fire-Resisting," we reported at the time. The author condemns matchboarding, naked floors with exposed wooden joists without any ceiling, studded partitions, lift inclosures and doors, fittings, lights, wells, and narrow streets—all defective and very risky arrangements. Mr. Clarke rightly objects to half-brick trimmer arches to carry hearths in wooden floors, the arches having the centring left in, and forming an open space under the brickwork lathed and plastered. The hearth should be of concrete the full depth of floor, with flat soffit for the plaster; he also advocates fireclay linings to all flues. The papers by Mr. B. Dicksee on "Fire Preventive Clauses in the Building Act" we lately discussed in its main provisions, and the valuable paper by Mr. Ellis Marsland, district surveyor, on "The Planning of Large Retail Commercial Establishments" we have also reported. These papers are given in extenso, and are well worth perusal. Section II. on "Electrical Safeguards and Fire Alarms," and Section III. on "Storage of Oils and Spontaneous Combustion" are interesting subjects, and many useful papers are printed. Section IV. contains papers on "Fire Survey and Fire Patents," Section V. "Fire Losses and Insurance," Section VI. on "Fire Tests and Standardisation"; but to notice any of the papers on these sections would go beyond our limits. The paper on "Safeguards Against Fire Caused by Lightning," by Alfred Hands, F.R.Met.S., shows several cases where towers and buildings have been struck, and where the conductors have failed to conduct the current. These are illustrated. The subject of "Electric Wiring" is dealt with by E. C. de Sagundo, A.M.Inst.C.E. "Fireproofed Wood as a Building Material," by Professor Woolson, Columbia University, in Section III., is also worth reading. The last section contains many instructive papers on "Fire Insurance and Fire Risks," and "Rules for Standard Fire-Resisting Construction," "Fire Insurance on American Principles." We have already referred to the paper on "Standards of Fire Resistance," by the Chairman; the tables give the suggested minimum requirements of resistance for materials or systems of construction, for (1) floors and ceilings, (2) partitions, and (3) single doors with or without frames. The resolutions which are the practical outcome of the conference are printed in a separate form, and we can only give here a brief résumé. We have already stated that the congress has condemned the use of the term "fireproof," and its indiscriminate application to building materials and systems in use; that the term "fire-resisting" is more applicable, and more correctly describes the varying qualities of the different materials and systems of construction intended to resist the effect of fire for shorter or longer periods at high or low temperatures; they also confirm the three standards of fire

resistance already mentioned according to the schedule. Another resolution considers that in all reports dealing with fire resistance the metric system of measurement, weight, and temperature should be adopted, as well as any local system. Other resolutions recommend the establishment of testing-stations for fire-resisting materials, and the adoption of a universally-recognised method of testing; also the formation of a permanent international technical bureau, which shall meet at certain periods to discuss, fix, and from time to time modify, universal methods of testing; the revision from time to time of local building regulations, so as to bring them into accord with results; that courses of study should be provided in universities, technical colleges, and schools for the instruction of engineers and architectural students in the fire resistance of building materials and methods of construction; that public authorities should encourage fire-brigade officers to take an interest in the preventive aspect of fire protection; that fire brigades should be placed on a sound legal basis, and their efficiency be supervised by a Government Department; that an official investigation should be made of all fires; that technical fire reports should be published for the public instruction. Other resolutions recommend the maintenance of private fire appliances, the necessity of distinguishing between safe and unsafe constructions in fire insurance rating, that the Factory Mutual Insurance System of the United States materially tends to the prevention of fire. Other resolutions recommend that for the safety of the public in attending theatres, easy means of exit from the auditorium by direct and clear routes, as distinct from circuitous routes, the provision of suitable fire watches and careful fire survey with a view to prevention of fire, the provision of automatic sprinklers over the stage; that these fire watches should be manned from the public fire service; uniformity of pattern, &c., of appliances; duplicate water supply service. An important resolution is that the congress "considers that every government should embody the primary equipments of fire prevention and protection in a Fire Act, leaving local regulations to be drafted by local authorities to meet local requirements, such regulations to be based on model by-laws." Another resolution was to the effect that the Technical Commission of the International Fire Brigades Council and the British Fire Prevention Committee, conjointly consider the possible publication in English, German, and French, of technical experience obtained at fires as an international publication. These are the main subjects. The report is largely taken up with the order of proceedings of congress, opening arrangements and speeches, the names of delegates, deputed by powers, home and foreign societies and boroughs, ordinary members' names, and discussions which have only an ephemeral interest. It however embraces a large fund of information and statistics on fire protection that will be of value to the profession.

THE ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting for the present session was held at 9, Conduit-street, W., on Friday evening, the President, Mr. H. T. Hars, F.R.I.B.A., in the chair. The President formally nominated Mr. Louis Ambler as Hon. Secretary, in succession to Mr. H. P. G. Maule, recently appointed as Master of the A.A. Day School. The motion was unanimously agreed to, and Mr. Ambler took his place beside the President amid hearty applause. To fill the vacancy on the committee occasioned by Mr. Ambler's promotion, Mr. G. B. Carvill was unanimously elected, also on the motion of the President. The following fifty-four gentlemen were elected members:—Messrs A. Hordern, C. H. Simpson, E. S. Charlton, H. C. Benson, J. F. Munnings, L. W. Edmonds, Leslie W. Green, J. A. Rogers, E. C. Burrows, B. Oliver, A. E. Hunt, L. S. Sullivan, P. K. Phipps, H. R. Smales, E. F. Duncannon, J. S. Turner, F. Nash, H. B. Newbold, R. I. Jones, C. S. Kimpton, F. H. D. Brockman, C. R. Davy, L. Kesteven, T. A. d'Arcy Braddell, P. G. White, J. M. Kellett, H. M. Gundry, C. E. Hanscomb, W. E. Woodin, F. J. Park, T. Braddock, C. R. Shield, J. B. Healing, E. S. Whitney, F. T. Bush, G. B. Griffith, S. H. Collins, J. B. Scriven, J. T. Sugden, L. T. W. Sinkins, C. A. Covernton, K. H. Milne, W. H. Ludlow, D. W. Clark, P. May, J. H. Chaudler, R. W. Pickering, G. D. Burgess, F. E. Mennie, W. Harvey, L. H. Read, and L. A. D. Shiner.

Mr. MAURICE B. ADAMS remarked that since they last met Mr. H. W. Brewer, the gifted artist, had passed away. Although Mr. Brewer had not been a member of the Association, nor indeed an architect by profession, yet they all appreciated his great skill and beautiful draughtsmanship, and he felt sure all would wish to join in passing a vote of condolence to his sons, one of whom was making his way in the pursuit of decorative art. Brewer's imaginative drawings, illustrating the ideal in architecture in the *Builder*, had always been to the speaker a source of interest and pleasure. The motion was seconded by Mr. FORSYTH, and having been supported by the PRESIDENT, was agreed to in silence.

The PRESIDENT said he had a very pleasant announcement to make—viz., that the Royal Institute of British Architects had promised a donation of £500 towards the New Premises Building Fund, a gift most acceptable from a pecuniary point of view, and also as showing the practical sympathy of the Institute with the Association. He proposed a hearty vote of thanks to the R.I.B.A. Council, and also to the following gentlemen for donations received since the last meeting:—Mr. Alexander Graham, £20; Mr. J. S. Gibson, £10 10s.; Mr. W. G. B. Lewis (second donation), £2 2s.; Mr. P. W. Lovell, £2 2s.; and Mr. J. H. Squire, (third donation), £2 2s. It was announced that Mr. F. W. Pomeroy's class of modelling would open on Nov. 5.

DAY SCHOOL TEACHING IN RELATION TO ARCHITECTURAL PUPILAGE.

Two papers on this subject were read, the first by Mr. ARTHUR T. BOLTON, the first Master of the A.A. Day School, and the second by Mr. H. P. G. MAULE, who has recently succeeded him in that appointment. The walls of the meeting-room were hung with a series of admirably clear and vigorous drawings made by students of the school.

In giving an account of his stewardship during the first two years' existence of the day school, Mr. BOLTON remarked that the idea of establishing such a school had for a number of years been contemplated by the Architectural Association, and the chief hindrance was the idea that such a school would destroy the long-established and well-tryed system of architectural pupillage. Fortunately, he continued, it has been proved that this particular danger had been exaggerated, and it has been found possible, thanks to the loyal concurrence of the profession, to work the school as a preparation, rather than as a substitute. The architectural profession has been fortunate in retaining the old traditional system of pupillage, during a period of changes and reforms, until the reaction has set in, so that it is now possible for us to develop rather than to destroy a method of training which, rightly understood and carried out, is still best adapted to a profession like our own.

THE PUPIL'S CHARTER: THE ARCHITECT'S SAFEGUARD FROM DUMPING.

It is generally agreed that a boy from school entering an office direct is seriously handicapped, and runs a great risk of losing the years of his articles owing to his inability to pick up work of so unfamiliar a character to his previous training. The day school is not only the pupil's charter, but is also an immense relief to the mind of the conscientious architect. The number of pupils sent to us at the Architectural Association day school by the profession is conclusive on this point. Now, what shall we say about the raw material as we receive it from the public school? If I had a confidential five minutes with one of our head masters I should ask what is this vicious circle in which you are revolving? Your case appears to be that the public schools are waiting for the universities, while the latter allege that they cannot move on your particular account. Is not this all very much beside the mark? What are the statistics of public school boys who go to the university? and what are the responsibilities of the schools to those whom they launch into life ill-prepared for their future work? For years the public schools have been drawing on their great asset, the right instinct that determines the parent to send his son to one of these great schools, for the sake of the development of that standard of character which will mean so much hereafter in his life. But, giving such considerations due value, are the schools right in supposing that they can for ever defy the competition of the best Continental training, and of new institutions growing up on similar lines?

In pre-Colenso days we might have had a reference to "my Army class." Now I am afraid we are coming to "my preliminary Royal Institute of British Architects' Examination Class." This last is a frightful outcome of our pet mania; we are classing ourselves with China as the two examining nations. It has occurred to some to wonder when it will be common knowledge that our primary schools work no longer under examination, but through inspection, to the immense relief of the teacher, and the great benefit of the scholar. It is apparently a crime like that of Oliver in asking for more to suggest that a certain architectural school might recruit itself by a similar method. The cause of public school deficiencies lies fairly deep. The remedy is known, but it is the will to apply it that is lacking. To justify such views it will be necessary to consider in brief outline

THE IDEAL OF EDUCATION

which we have in our minds, and to try and arrive at certain deductions from experience and observation which may guide us in a problem of such complexity as education. In the first place, let us start with the principle that education is not the acquisition of certain definite information, but the training of the mind to meet contingencies that can never be accurately foreseen. In the clear meaning of the term, it is the leading out or development of the powers of the mind, combined to some extent with a correcting and supplementing of native qualities. I am afraid this last limitation may not satisfy some enthusiastic teacher engaged in the most thankless of educational enterprises—that of instilling refinement in a mind of an incurably base type. May the teacher gain by the effort! What, now, is the ultimate object of education? The ideal of education is simply the development of mental power. The true educated man is not necessarily a product of university training, nor even, as a matter of course, a student of wide reading in books. This is a perpetual stumbling-block to many worthy people who confound the means with the end, and fail to realise by how many paths the goal of a well-developed and rightly-ordered mind may be reached. The accumulation of facts is of itself of no value whatever unless it is accompanied by a simultaneous development of the reasoning powers; nor is the study of grammatical niceties essential to a comprehension of a great literature or art. We must not, in fact, reverse the natural order of the acquisition of knowledge. Observe the process of a child's mental development. It is in essence a perfect specimen of the Socratic dialogue. The child's interest is first aroused, then comes the question, and following swiftly on the reply his more or less logical deduction, ending possibly in a perfect dilemma for the unfortunate parent. It is a mystery to me that so many teachers ignore this natural method. Students are drawn up blank against some concentrated essence, mainly grammatical, of a subject, and expected to develop an interest in the dry and often useless facts of which they utterly fail to grasp the bearing. The customary excuse is that of the importance of accuracy, which, however, is to be taught of itself, and probably can be far better inculcated through the verifications of experimental science than by literary and grammatical means. Let us now apply these principles to

ARCHITECTURAL EDUCATION.

In the first place, it will follow that neither Gothic nor Classic art of themselves are wholly necessary to salvation, and that the mere examination facts are not of themselves of any value whatever. What we shall need will be to give our beginner a good general survey of the historical development of architecture treated in relation to the character and conditions of the people and countries where it originated, utilising for this purpose the method of the contrast of opposites and its contrary of imitative resemblance. This survey should lead to the apprehension of certain central facts, the unity of all architectural expression in spite of its diversity, the possession of common qualities, and the permanence of artistic expression. When a student reaches the point that he can, as it were, make a summary division into two styles, the plain and the ornamental, has learnt that there is no monopoly in beauty, and realises that proportion, character, and fitness are all parts of one then he has begun to justify his education. He has entered upon a path presenting possibilities of progressive growth. A stumbling-

block for the young student is that presented in the right

RELATION OF ART TO NATURE,

more especially in architecture. When told "to study Nature" in the common phrase, the impression most probably produced on his mind is either one of mere bewilderment, or else a confusion of the imitation of concrete form with the outcome of deductions from an observation of natural facts, directed towards the apprehension of abstract qualities, capable of illustration in architecture. Take the commonest fancy of an amateur, that the nave of a Gothic cathedral is a copy of a grove of trees, and compare with this Darwin's suggestion that the awe which we feel on entering a grand building finds its origin in the effect produced on early man by the caverns and forests in Nature. The fallacy of the grove of trees strikes you at once as too gross for discussion, but the underlying idea is always cropping up in changing forms. Its plausibility depends on the fact of a certain coincidence of result in the works of man, reached through a long series of logical developments, with the seemingly irresponsible work of Nature. An instance given in Garbett's "Principles of Design" is the relation between the elephant's foot, the human hand when raised to uphold a weight, and the highly-developed Doric column. Similarly in Gothic architecture, in certain phases of its fullest expression, an analogy may be felt between the intricate clustering of relief and open work, and the tree tracery of the woods in winter. In Renaissance work quite recently an attempt was made to base a theory on forms coincident with Nature's spiral as seen in shells. The student once having found admittance to Nature's school is provided with a field of unending study. This observation and reflection on Nature is in many cases purely instinctive, and not seldom possessed without any capacity of expression, as it will be found welling up among dwellers in the country in unexpected forms. Much is said of the refinement of Turner's landscape, but to the artist himself, full of the sense of Nature obtained from life in the open, his work was doubtless but a coarse transcript of infinite subtleties. No student must rest content with a mere feeling after Nature's charm. Emotion must be translated into work, however imperfect, and the effort maintained through cloud as well as sunshine. Nature's process is infinitely slow, and artistic stature cannot be increased by taking thought any more than physical. The student's greatest enemy is his own self-conceit. There is always a place for the patient worker; but the flashy student incapable of independent and sustained effort will always remain a burden to his teacher. Every student is a problem in himself, and needs individual care, and the wisest teacher will be the least dogmatic in his judgment of capabilities, and the least ready to shut the door. In this hasty and imperfect sketch, fellow-students, I have tried to indicate to you

THE UNDERLYING SPIRIT

in which your education may be pursued. You came here, perhaps, expecting to hear about the details of the method employed in the day-school. We can all differ in that respect, and a student's own experiences will colour his personal prepossessions. I do not propose to justify the particular means employed—I might find myself launched into biographical particulars—but the foundation requires to be sure, and the basis must be a close touch with the actualities of our own day, and a solid continuity of effort on the part of the student not afraid of hard work. We are not entitled to set our students on a path which will make it harder than it need be for them to earn money within a reasonable period. The day school has been run on semi-office lines, with an effort after a thorough grounding in the drawing methods in common use. We may agree that skill in draughtsmanship is by no means the essential quality of an architect; but it is certainly a necessary qualification for an assistant requiring a place in an office, and we must look forward to the anxious period when, at the expiration of his articles, our day-school student has to give workaday proof of his powers. While giving prominence to draughtsmanship, I never could myself agree to its pursuit to the detriment of the study of design, nor could I could see the reason for postponing that important subject to quite a late stage in the student's career. In the second year course of the day school we have started the student in that important branch of his future work on very

conservative lines, utilising the interest of the student in creating something, to deepen his studies of the first year, and guiding him in his first essays by the sure aid of the past examples of his art. If you will look at the drawings in the second year, they will show you how interesting and practical the study of historical architecture may be made, and you will realise that for the preparation of these designs something more than a surface knowledge of the particular phases illustrated must have been acquired. I have a particular wish to secure your support for my successor in his important task of developing the equipment of the day school. The liberal assistance from the committee and the general body should be forthcoming in this matter. I am sure all the staff of the Architectural Association will hail with especial thankfulness

THE SOLUTION OF THE PREMISES PROBLEM,

which has lain across the path of the natural development of the Architectural Association for so many years. Hurry up and pay off this debt, so that the committee may devote themselves to the reorganising and equipment of the schools, which should do so much for the coming generation of architects. The day school has doubtless been a useful piece of underpinning; but there has always seemed to me to be

A TOP STORY WANTING

in our educational structure. A pretty good believer myself in Architectural Association methods, and fairly diligent in the classes, there came, all the same, a time when something more consecutive and thorough seemed to me to be essential. In my view it need not have been necessary to go outside the Architectural Association for such further study. Are our young students quite satisfied to-day, after, say, a year or two in the school of design? And if they are now, will those who pass up from the day school continue to find this school, admirable as it is within its limits, sufficient for the completion of their training? It is probably much better that the Architectural Association should finish its own students, affording them, on the slightest indication of the demand, the most advanced education that can be given. Whatever the future development may be, let us hope the Architectural Association will know how to preserve its old characteristic of mutual instruction, free from the isolating effect of systems of education that separate the teachers and the taught into separate classes. In the day school I have seen a smile on the faces of the class when I have touched on this point; but, for myself, I have learnt much from my two years' experiences, and I earnestly recommend some of our brilliant students to seriously consider whether they ought not to take their turn in our educational work. You all know of the zeal of the late Arthur Cates, whose loss the Architectural Association has so much reason to regret. In the last conversation I had with him this was one of the points he insisted upon, urging the value of the effort to teach others to the teacher himself. The Architectural Association ought to maintain a very large and able staff, as the numbers of students passing through the schools offers a very considerable field of selection. To those who dread captivity, we can reply that they are not asked to undergo a life sentence, and as to what they will get out of it, say all those things which are not learnt from books. Where it is an honour to serve, understaffing need never exist, and the strain of teaching can be immensely lightened by a liberal policy in this respect. Intercommunication and common action on the part of the teaching staff will naturally develop with reorganisation in our new home, to the great benefit of the students and the avoidance of overlapping. In labouring on behalf of our young students, architects can find a practical solution of many divergencies. Pardon me this parting word of advice: Retain your own opinions, but do not make them an excuse for holding back from the work.

In the paper which followed, Mr. MAULE observed that with the general outline of what Mr. Bolton had said he most cordially agreed, and he felt that the difficulty of his task in carrying on the work was light compared to Mr. Bolton's in starting it, and that in handing it over, every detail, every paper, was in perfect method and order.

TWO IMPORTANT FACTS.

With the Architectural Association scheme it is necessary, Mr. Maule proceeded to say, to bear two facts in mind—first, that the first year's

course consists in reality of only nine months' actual work in the school, as three months are allowed for independent out-of-door study, which forms an important part of the student's training. Secondly, that almost the most important part of the training is the second year, when the student is, in all probability, four days a week in an office and only two days a week in the school, during which time his study takes the form of directed exercises in design. This obviates the charge of mere academic teaching, as the student is brought into contact with the actual professional work of the day. Now,

THE PRIMARY OBJECT

of the day school is to enable the student to acquire, during the first year, such a knowledge of architectural drawing, of history, and of construction that when he goes into an office as pupil he can begin at once to take advantage of what he will there see and learn, and thus dispense with that awkward period, which most of us have experienced, of being plunged into an office with none but the vaguest idea of what to learn or how to learn it.

THE CONTINUATION OF EDUCATION.

There is another important feature, and that is that the organisation and method of the school training should enable a student to carry on his own education subsequently (supplemented, of course, by lectures and classes) with more directed method and application than is possible from an initial start in an office. Now, the amount of "in-school" time available in the first year's course—namely, actually only nine months—seems to me to make it imperative that the training during that period should be on the broadest and simplest lines possible; that the training should, in fact, be mainly directed to teaching the student a method of learning. To begin to learn to draw; to begin to learn to observe; to begin to learn to think; and, above all, to endeavour to naturally fire and regulate his enthusiasm, and lead him to love his work for its own sake. Without this latter as a resultant of the training, it is but labour lost so far as architectural training is concerned, though no doubt much useful knowledge would be gained which would always be an advantage in any work afterwards taken up.

THE ARCHITECT'S EVOLUTION.

The training, or rather the evolving, of an architect from the raw product of the public school is a long and complicated process, and when the shortness of the initial period, and amount of technical and constructive knowledge that is ultimately required, is taken into consideration, it seems self-evident that this early period should be made broad and general, and, above all, not too technical. It must not be forgotten that, no matter what brains a student may have, nor how highly trained he may be so far as general education goes, of the special subjects of an architect's calling, whether history, construction, or elementary design, he is in almost all cases entirely ignorant. His mind, therefore, no matter how receptive or retentive, cannot assimilate more than a certain amount of new matter, and it is assimilation and thought, and not an ill-digested assortment of facts, that really constitutes a good education.

DRAWING.

The construction subject as inaugurated by Mr. Bolton seems the best of all methods for insuring a simple and thorough grounding in elementary construction and materials, so long as the complete and direct relationship between materials, construction, and design is clearly kept before the student—a connection which there is every reason to believe is sadly neglected in much of the work which now passes for architectural education. I also attach great importance to the early, careful, and systematic drawing of simple full-size details in connection with the construction subject, for an abbreviation, such as a set of $\frac{1}{4}$ -scale drawings, cannot be properly understood—or drawn—unless the component parts, such as door and window openings, which they abbreviate, are clearly understood in detail. In all the work done in the school, great care should be taken to insure accuracy and clearness, and special attention should be directed to printing, and the value of clear and legible notes on working drawings and tracings.

OBSERVATION AND THOUGHT.

To an assembly of architects it is quite unnecessary to emphasise the importance of observa-

tion or the necessity for thought. The eye sees what it is trained to see, and the eye is the greatest of all educators; the mind also develops its thinking faculty by knowing what to think about. Unfortunately, the cultivation of observation does not apparently form part of an English school curriculum, and though most little children are very observant, the habit is generally crushed out of them long before they have arrived at an age when observation, and correct deduction from that observation, complement one another. To reawaken the lost habit, if, unfortunately, lost it is, should be one of the great aims of the training, and this awakening of observation, directed as it is, will surely bring with it the development of thought. Organised logical thought, the thought that will eventually enable a man to design with beauty and build with truth, because he sees clearly and without confusion, can only come with years; but the germ can surely be planted and tended during the first year in the school. Last, but not least,

ENTHUSIASM.

A famous writer once said that nothing was so catching as enthusiasm, and certainly no life work should be so capable of generating enthusiasm as the study and practice of architecture; but if the early years of training are overburdened with dry technicalities, or with work too far in advance of fairly easy comprehension, there is grave fear of the failure to awaken this divine spark, without which the whole structure of architectural education falls to the ground.

Mr. MAURICE B. ADAMS proposed a vote of thanks to the readers of the papers. This was seconded by Mr. A. M. WATSON, and supported by Messrs. MAX CLARKE and G. H. JENKINS, the latter urging that the course at the day school ought to be extended from two years to four, or even five years, as was usual in Germany. The motion was endorsed by the PRESIDENT, and carried unanimously, and acknowledged by Messrs. BOLTON and MAULE.

THE SOCIETY OF ARCHITECTS.

THE nineteenth annual report of the Council, for the session just ending, read and adopted at the meeting of the Society held last (Thursday) evening at St. James's Hall, Piccadilly, W., states that there has been a satisfactory increase in the membership, more than fifty applications having been approved, and thirty-three candidates have been elected, the remainder pending election. Fifteen members and two associates have resigned; one member has been transferred to hon. membership, four members have been removed from the roll, and three have died. Over twenty applications have been approved for the Students' Register, of whom thirteen have been elected this year, and there have been four resignations. Two competitions have been held during the past session, the subjects selected being "A Design for a Cottage Hospital," and "Measured Drawings of a Chancel or Side Chapel Screen," a prize of the value of three guineas being offered in each case.

The designs submitted in the first competition were carefully prepared, and were very close in order of merit. Mr. B. C. Ernest Bayley was placed first, and Mr. J. Nixon Scaife received hon. mention. There were no entries for the second competition.

The all-important question of Registration has received fresh impetus during the past year, and good progress has been made in preparing the way for further action. Early in the session the "Architects' Registration Bill Committee" was amalgamated with the Council of the Society of Architects, as a joint "registration committee," under the chairmanship of the President of the Society for the time being. Steps were then taken by means of a circular letter and reply postcard to ascertain the views of recognised members of the profession on the principle of Registration. It has been ascertained that some two-thirds of the profession has declared itself in sympathy with the movement for obtaining the statutory examination and registration of all persons entering the profession of architecture, and from the fact that less than 170 voted against the principle, and as every possible facility was given for voting one way or the other, it may reasonably be inferred that an overwhelming majority of the profession is in favour of legislation on the lines indicated. The society's circular received consideration by the Council of the R.I.B.A., which issued a counter-

statement, followed by a request to the allied societies to express their opinions on the matter. Several of the latter have since passed resolutions in favour of the movement, thus confirming the individual voting of their members, which shows that almost without exception the allied societies agree with the principle of registration. The persistent action of the society has naturally revived the antagonism of the few who, from the first, have strongly opposed any measure of the kind contemplated, and the usual paper controversy has resulted; but, on the other hand, many architects who hitherto have remained neutral, and some who formerly opposed, have thrown in their lot with the "Registrationists," and the support which the Society has received will enable it undoubtedly to attain its aim in due course. The Architects' Registration Bill, which is under the charge of Mr. L. A. Atherley-Jones, K.C., M.P., has been carefully revised by the joint committee, and again introduced into Parliament, and no effort will be wanting on the part of its supporters to secure its passage. The Council feels that many of the difficulties inseparable from the movement are being successfully overcome, and that steady progress is being made towards attaining the object in view. The Council has had before it the proposed London Building Act Amendment Bill brought in by the London County Council with the view of minimising the danger of fire; the Bill, however, was subsequently withdrawn, and the London County Council has since invited the Society to make suggestions as to any revisions to the Building Act generally. The matter is being dealt with by a sub-committee. The St. James's Hall property having been sold, it has become necessary to find other quarters, and the Council is in negotiation for premises in Holborn, which are well suited for the purpose. It is hoped shortly to make a more definite announcement. The Society was officially represented as follows at the several Congresses:—International Fire Prevention Congress, London, July.—Silvanus Trevail, J.P., F.R.I.B.A. (President), G. Gard Pye (Vice-President), W. Cooper and R. G. Bare. Sanitary Institute Congress, Bradford, July.—Walter W. Thomas (Vice-President) and S. Robinson. Royal Institute of Public Health, Liverpool, July.—Walter W. Thomas (Vice-President) and T. G. Williams.

On May 15, 1903, the members' Annual Dinner was held at the Prince's Restaurant, when the President, Mr. Silvanus Trevail, was supported by a representative gathering of over two hundred members and guests. On May 23 a very successful field day was held at Rochester, when some seventy members and their friends attended. Mr. G. Payne, F.S.A., acted as leader. On June 15 the Society paid an official visit to the Building Trades Exhibition at the Agricultural Hall, when some fifty members availed themselves of the opportunity. On September 30 the British Fire Prevention Committee made arrangements with the Directorate of the International Fire Exhibition, Earl's Court, for members to visit the Exhibition, when about seventy accepted the invitation. The Council has under consideration the drafting of a scale of charges and a form of contract for the exclusive use of the members, it having been represented that such would be of service. Many difficulties present themselves in formulating a scheme which will meet with general acceptance, and members can greatly assist the Council by suggestions. A large number of inquiries continue to be received for the half-yearly examinations, and the number of candidates is increasing. Examinations have been held during the session at London and also in Leeds. The syllabus has been further revised, and the regulations as to the admission of candidates made more stringent. In view of the recent introduction into Parliament of a Bill to amend the law relating to ancient lights, drafted by the Royal Institute of British Architects and the Surveyors' Institution, the question of further action by the Society in the way of legislation is in abeyance, pending the report of a committee upon the proposed Bill. The outgoings during the year have necessarily increased with the development of the Society's work, and there have not been such exceptional opportunities as occurred last year for augmenting the finances, more particularly in connection with sub-letting the hall; but it is expected that the auditor's report will show an increase in the ordinary income and a satisfactory surplus. In conclusion, the Council state that good progress continues to be made in every department. The

membership in particular has shown a more than usually satisfactory increase, there being a total membership of six hundred and fourteen, while there are indications of a further steady growth in membership and influence. The step which the Council took with regard to Registration has met with general approval and support, and the Society has a weight of opinion with it, in addition to its membership, which will greatly assist in the further prosecution of the movement.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

THE ordinary monthly meeting of this society was held on Thursday night in last week in the society's rooms, Leopold-street, Sheffield, Mr. E. Holmes occupying the chair. The President (Mr. Thomas Winder) gave his

INAUGURAL ADDRESS.

Mr. Winder mentioned that the Council of the Royal Institute of British Architects was again giving consideration to the question of Registration, and that of the Surveyors' Institution had adopted alterations to their rules which almost amounted to making surveying a closed profession. Sooner or later the question would have to be faced both by surveyors and architects in consequence of the action of members of another profession. No architect or surveyor of standing would dream of drawing up legal documents or of interfering with legal questions, and it was greatly to be regretted that members of the legal profession were abandoning professional traditions and encroaching seriously upon the duties of the surveyor, the valuer, and the land agent. Large numbers of plans were being drawn upon legal documents, often most incorrectly, by irresponsible junior clerks in solicitors' offices, and drawn with as little understanding of the meaning of the work as ability to make a correct plan. These plans were charged for, and this was unfair to clients, and would prove a fruitful source of litigation. Solicitors were also computing areas of plots, subdividing leaseholds, negotiating sales (including valuation), and, wherever possible, absorbing the duties and emoluments of surveyors and land agents. This was but another phase of the curious system by which one went to the draper for plumbing repairs, and to the chemist for stationery and literature, and it had been greatly stimulated by the publication of that most misleading publication, the 4 to 1 in. Ordnance Map. Perhaps the burning question of the day was the provision of so-called "artisans' dwellings." The question would very closely affect their professions were it not for the opinion that the introduction of professionalism into the question was undesirable. The city council recently had an opportunity of getting the benefit of the experience and ability of the whole of the Sheffield architects, but was most careful so to frame its conditions as to prevent the majority of the members from competition. Their members could, and would, have given invaluable assistance in the solution of that most difficult problem—the provision of a sanitary and convenient cottage, at the minimum cost, with the maximum accommodation, which would comply with the Corporation by-laws (this was a *sine qua non* unless the city council was building), and should also conform to the fads of the Local Government Board, one of which was that the smell of cooking should be confined to the kitchens. He had elsewhere expressed the opinion that the authorities were making a cruel and gigantic blunder in the way they were approaching this most difficult social problem. They condemned a large area of property and destroyed numbers of houses long before others were erected to take their place. This could only result in the poor creatures turned out herding in already overcrowded houses, with results such as he came across recently, where seven families were packed into one house, whilst the local authorities—not of Sheffield—were squabbling with the Local Government Board because the latter considered the workmen's dwellings were too large for people one-third of whose earnings would be absorbed by the rent of the corporation-provided houses, even should they be fortunate enough to secure them. What were wanted, and what the architects of Sheffield should be encouraged to design, were small, well-built, inexpensive houses of from one to five rooms, which unskilled workmen, widows, and others who earn a bare living wage could afford to rent. No one would grudge the erection of such houses,

even if they were let at a loss, but to erect villa residences which ratepayers had to subsidise was unfair to ratepayers, to contractors, and to property owners, and to all but the fortunate, and generally far from needy, few who got possession of them. His idea was that if corporations could be induced to adopt the system in vogue amongst railway and water works contractors and erect iron houses upon sites which at the present time were suitable, they might in twenty or thirty years remove them and erect others on sites which would then be more suitable, making a handsome profit out of the improved value of the old sites. The piling up of by-laws and Acts of Parliament for municipal or urban aggrandisement was a very grave menace to the city's future wellbeing. The fact that a person who inadvertently or otherwise broke a by-law was allowed in some cases to continue to do so on payment of an annual fine was proof that such by-law was unnecessary. This was further proved by the fact that corporations repeatedly ignored their own by-laws. The council of the society had given much time to the consideration of the education question, and had reason to hope architectural education would enter into the curriculum of the new Sheffield University. The recent visit of the British Archaeological Association to Sheffield had drawn attention to the rapidity with which ancient buildings were disappearing, and had shown how poor were the records which had been kept of them. Could not the Architects' Society do something to preserve them from utter oblivion, enrich their library and increase its usefulness by adding to it photographs and measured drawings of the few remains which were worth recording. The committee of the High Hazels Museum would accept with gratitude any ancient object of local interest, and they might assist in making a valuable collection of old lead hoppers, mantels, plaster-work, and especially examples of early cast-iron work.

EVOLUTION OF THE FARM BUILDING.

The President also gave an interesting lecture, illustrated by lantern slides, on "Farm Buildings." He opened with a plea for the use of local materials, and gave a rapid sketch of the evolution of the English homestead, which he believed was a development of the Saxon one, in which the master, men, maids, and stock all dwelt under one roof. This was followed by remarks on the position of the homestead upon the holding, upon drainage and the water supply, in which he warned his hearers against the danger of infection to wells, &c., by the percolation of water through worm or mole-holes, or through holes made by the roots of trees and vegetables. He said that it is usual for the farmer to bear the cost of the team work for new buildings—which is probably a survival of the old boon-team service—a feudal service which was not altogether obsolete when he entered the service of the Duke of Norfolk, 30 years since. The best arrangement of the various buildings with their respective positions on the homestead was then considered, together with the most suitable materials for their construction. The lecturer drew the attention of his audience to the anomaly of the use of the same by-laws as to air space and ventilation for cow-houses situate in the slums of a city and for those on the bleak Derbyshire and Yorkshire hills. He said the pigeon cote was not now obtaining the attention it deserved, and that where a large cote was found upon a 17th-century homestead, that homestead would probably prove to have been the manor house, and gave as examples of this Kimberworth, The Grange, Hesley Hall, Hands-worth, &c. He wound up his lecture with a description of fox-earths constructed by him in the Treeton Woods for the protection of vixens and their cubs.

On the motion of Mr. Gibbs, seconded by Mr. J. Smith, and supported by Messrs. E. Holmes, H. L. Paterson, and others, a hearty vote of thanks was accorded to the President for his address and lecture.

THE NEW GAIETY.

THE private view of the New Gaiety Theatre at the corner of the Strand and the western arm of Aldwych, and which is to be opened next week, took place on Tuesday. The London County Council in acquiring the old Gaiety premises granted the proprietors a lease at the

rent paid for the old theatre, for fifty years, of the adjoining area now built upon.

The new site allotted consists of 12,800 square feet, as against about 11,200 square feet upon which the old theatre stood, and has a frontage of about 27ft. 6in. to the Strand, a corner frontage of 40ft. and a frontage of 138ft. 6in. to Aldwych, both of these thoroughfares at this point being 100ft. in width.

In settling the question of reinstatement with the Council, a sum of money was agreed upon (£50,000) as the "minimum" to be expended in covering the site, and a sum beyond this by way of compensation for disturbance. Designs were prepared and were part of the agreement as a "type" contemplated by the parties in entering into a contract; but a special provision was made whereby the Council, should they desire a building of a more ornate or costly character and design, should pay the difference between the cost of such more ornate design and the "type" design. The perspective of the original or "type" design, which was on the line in the Academy in 1901, was intended to be carried out in red brick and Portland stone. It was then found that the theatre could not, with advantage, be carried up to the full height of 80ft. as permitted by the Building Act, as this great height was unnecessary, and the adjoining New Gaiety Restaurant and Hotel (also being reinstated) would, for obvious reasons, take advantage of such maximum height. The Council were of opinion that the differences in the heights of the two structures was not desirable, and were further of opinion that the material for the exterior should be of a more costly character, and the design more elaborate and ornate, and the architects were instructed to send in an amended design. This was done, but prior to this eight suggestions by as many architects had been submitted to the Council at its invitation for the general treatment of the elevation upon the Strand Improvement, leading to a deadlock, which was ultimately solved by Mr. R. Norman Shaw, R.A., being approached by the architects, with the consent of the Council. Mr. Norman Shaw prepared sketch designs for the exterior which were acceptable to the Council, and from which the architects prepared the working drawings of the exterior as now executed. Mr. Runtz's original design was illustrated by two large perspectives in our issues of Aug. 23 and 30, 1901, and the revised design, as now carried out with certain modifications by a double-page perspective and two plans in the BUILDING NEWS for September 26, 1902.

The disposition of the site, with its two frontages diverging from the important circular corner, has naturally influenced the internal planning of the building. The position for the chief entrance was necessarily at the junction of the improved Strand and the new Aldwych, and gave the cue to the general internal arrangement, suggesting a symmetry of plan as regards exits and entrances about an axis passing through the main entrance. This, together with the circular treatment of the crush-room and foyer at the angle, became the guiding principles in the planning of this theatre. Entered under the dome, which is about to be erected at the corner, is a circular columniated crush-room, with retiring rooms and box office, from which staircases lead right and left up to the grand circle back. This again leads one right and one left for the full width of the tier, with three entrances thereto and down both sides of it, with additional entrances at the bottom, and midway between them on either side an extra exit on to the street, which obviates the necessity of passing through the crush-room in the event of a panic. This arrangement obtains practically in all parts of the house. Below the crush-room is the stalls saloon, and above it are the saloons to the grand circle, balcony, and gallery, all following the lines of the crush-room and circular or oval in plan. A special feature has been made of private retiring-rooms or lounges to the private boxes of the stalls and grand circle tiers; those to the latter on the O.P. side become the Royal retiring rooms, with a separate entrance from Aldwych, and with private and separate accommodation. The ranges of boxes and the adjoining retiring rooms can be respectively thrown into one at will. The entrances and exits to the parts other than the stalls and grand circle are alternately in the Strand and Aldwych. On the north side is provided a convenient and commodious suite of offices for the use of the management. The open colon-

nade or loggia on the upper floor of the main façades is approached by two staircases from the gallery level. The theatre is a "three-tier house," and the seating accommodation is approximately as follows: Gallery 400, upper circle 260, dress circle 172, stalls 146, pit 300, private boxes 48; total 1,326. The principal dimensions are as follows: Auditorium, 60 ft. by 64 ft. deep; proscenium, 30 ft. wide by 36 ft. 6 in. high.

Behind the proscenium is a stage, 40 ft. deep, and of an average width of 80 ft., with a mezzanine floor and cellar below. Right and left to the Strand and Aldwych are the stairs leading to the stage exit and entrance, and the dressing-rooms, numbering twenty-nine in all. The flies are provided with a separate gallery for the convenience of the electrician managing the special lighting effects and lines. The gridiron is of more than usual working capacity; it is 70 ft. above the stage.

The simple proportions of the Italian Renaissance of the Florentine School have supplied the motif of the external treatment, relief for the large wall spaces being sought in the large circular-headed windows and niches with their pilasters and pediments. The massiveness of the treatment is crowned by the open order of coupled Ionic columns, entablature and balustrade. But the most striking feature will be the large dome, 40 ft. in diameter and 90 ft. above pavement level, now about to be begun, supported by seven pairs of consoles, and surmounted by a winged female figure 17 ft. in height. It is anticipated the dome and surmounting figure will be complete by the end of November. The whole of the façades are executed in Portland stone, with bands of Verde Antique marble. The internal dome will be constructed of steel and concrete. The external dome will be built up in steel and wood, and covered with copper. The crowning figure is being executed by Mr. Hibbert Binney. A new feature, not shown on our perspective published in September, 1902, is a covered shelter of iron and glass, forming the approach to the main entrance at the angle of Aldwych and the Strand.

The whole of the construction is as fireproof as is practically possible, and generally consists of cement, grey stone and blue lias lime, brickwork and steel, and concrete floors and roof. The floors are almost exclusively finished in cement, and the roofs of auditorium with a double layer of asphalt. The steps throughout are granolithic. Scagliola is employed in the columns of the crush-room and foyer, with modelled caps and bases in plaster. The constructional steelwork of the tiers, roofs, and dome has been executed by Messrs. Dennett and Ingle, engineers. The circles are constructed in steel and concrete throughout, and so designed as to carry from wall to wall of the auditorium without intermediate supports. The main girders of the circle vary from 3 ft. to 4 ft. in depth, and support lighter shaped girders, through which cantilevers project 12 ft. to 15 ft. to the front of the circles. The cantilevers are built up with steel plates and angles, and the larger ones have a depth of 2 ft. at the fulcrum. The total weight of the three circles when fully loaded is estimated at about 350 tons, and this weight is transmitted to the foundations partly by the brick walls and partly by cast-iron and steel stanchions imbedded in the brickwork. The stepped surface of circles is formed in concrete upon steel bearers spaced from 2 ft. to 3 ft. apart, and the ceilings are constructed with metal lathing suspended below the girders and cantilevers, and at such a level as to permit of an unbroken soffit and a clear height of not less than 8 ft. from circle to ceiling. The large dome is placed partly over the auditorium, and is carried upon steel girders at the roof level. The two main girders support loads of 200 tons and 120 tons respectively. The ends of the larger of the two girders come over openings in the auditorium walls, and are supported by twin riveted girders, and the weight is eventually transmitted to the foundations by means of cast-iron stanchions built in the walls. The total weight of the tower portion of the building at its base is estimated to be about 1,700 tons, inclusive of the loads supported upon girders and stanchions.

To cope with an outbreak of fire a complete system of high-pressure fire mains and hydrants is installed. In addition to this the proscenium is fitted with double thickness asbestos fire-resisting curtain, with patent slip gear at the stage level and at the stage door, as demanded by the London County Council, as well as the usual

raising and lowering gear and counterbalance weights. Provision is also made for cooling the curtain by means of a specially-designed sprinkler. The sanitary appliances have been supplied by Messrs. Doulton and Co., Ltd. The method of ventilation is by the propulsion system, and the ventilating and heating arrangements by Messrs. James Stott and Co., Ltd., are in combination. In designing the electric-light installation, every precaution has been taken to minimise the risk of a total extinction through the failure of supply. The two-circuit system has been installed throughout the theatre, in the auditorium, passages, entrances, and exits, the lamps being installed alternately on two circuits, connected to two absolutely independent sources of supply. As a further means of protection, a number of "police lights" are being installed, and connected to a third independent system of supply.

As to decorative treatment, the auditorium is flanked with twelve private boxes, with arched loggia over, forming also a constructional feature in carrying the novel vaulted ceiling with its squinch arch treatment, trumpet-like in general formation for acoustic purposes, and embellished with winged figures and modelling by Mr. W. J. Neatby, and three decorative tympanum panels in oils by Mr. Charles Buchel, representing Aladdin journeying with his retinue from his old to his new palace. Upon either side of this arched opening and in the spandrels are two niches containing figure-subjects of Music and Dancing by Mr. Hibbert Binney. The boxes are divided with pilasters and columns, in front of which are conventional figures bearing electric-light garlands. The ceiling over the auditorium is fan-shaped, with the divisions embellished with shells, masks, and swags. The circle fronts are of modelled plaster, principally by Mr. Sidney Webb. The mural decorations consist of a material by Rottmans, having a groundwork of old rose, with a raised art nouveau designed in gold, cerulean blue, Hooker's green, and permanent red being sparingly introduced. The decorative plasterwork throughout is by Messrs. George Jackson and Sons, of Rathbone-place, W. The crush-room is in the Georgian style, with marble columns, bronze caps and bases, supporting a modelled entablature and frieze; the floor is of marble mosaic. The foyer is treated in hardwood, the panels being occupied by full-length portraits of five Gaiety favourites: Nelly Farren, Kate Vaughan, Letty Lind, Sylvia Grey, and Ellaline Terriss. The frieze above is richly gilded, and the modelled ceiling entirely in ivory white. The gallery saloon is decorated in prevailing tints of white. The whole of the decorations of the building have been carried out by Mr. Edward Bell, in accordance with the specification of the architects. All the doors throughout the building are fitted with the well-known and convenient Yale locks. The architects are Messrs. Ernest Runtz and George McLean Ford, and in addition to the general structure, the whole of the decorative work and upholstery is from their designs. The contractor is Mr. Henry Lovatt, of London and Wolverhampton. Mr. Lovatt's foreman on the job is Mr. Bassett. The clerk of works is Mr. D. Davies, who occupied a similar position at the Adelphi, Apollo, and Wyndham's Theatres.

IRONMONGERY AND ELECTRIC APPLIANCES.

THE well-known firm of tool, machine, and hardware merchant, Messrs. R. Melhuish, Sons, and Co., 84, 85, and 87, Fetter-lane, Holborn-circus, have just issued a revised and extended edition of the ironmongery section of their catalogue, in which attention is drawn to the quality of the goods and the exceptional terms at which they are offered. The scale of prices very favourably compares with any wholesale house in the country. We can only glance at the well-illustrated pages of this catalogue, in which the architect and builder will find every variety of ironmongery and electrical supplies they may require. The suites of polished brass door furniture for outside and inside use are of good design, and suitable to every style of building. Each article has its price affixed. Several very tasteful designs are shown for finger-plates, Pitt's mortise furniture, door-knockers and handles, letter-plates. The door handles are in great variety of shape. Pages follow illustrative of brass and iron French window bolts, door chains, night bolts, Norfolk latches, sash lifts, lever handles, and other appliances for

doors. We draw attention to some excellent brass casement fasteners and stays on pp. 26, 27; also brass butt hinges and hooks for various purposes. The brass sash fasteners and door-springs are very complete. Rim, mortise, and other locks illustrate every improved make, from the 6 in. japanned steel-case two-bolt lock to 6 in. "Scotch spring palace-motion two-brass bolt" mortise locks and Yale mortise front-door locks. Shop-door latches is another speciality. Stable fittings, including stall and loose-box divisions, harness brackets, &c., cast-iron manger sets, gutters; ventilators, including Boyle's "air-pump" appliances, &c., form a section; another section is devoted to all the latest cookers, gas grills, radiating stoves, heating stoves, kitcheners, and grates of every approved type; mantel registers—some of these are original in design. The electric appliances, bells, switches, pushes, bell fittings, &c., are comprehensive, and include every requirement. The diagrams illustrating connections for bell indicator circuit, p. 270, &c., will be found useful; direct-working telephones, with diagrams of connections, will be found of much use in specifying and fitting, and the electric-light fittings comprise many elegant designs for ceiling fittings, drop lights, and pendants and brackets. Other sections of the catalogue are devoted to rain-water goods, gas-fittings, and sundry other details of general ironmongery. The catalogue is well printed and profusely illustrated, and every article is priced.

THE R.I.B.A. STANDARD SIZE OF BRICKS.

THE following standard has been agreed upon between the Institute and the Brick Makers' Association, and has been drafted in consultation with these bodies and representatives of the Institution of Civil Engineers, and ordered to come into force on May 1, 1904.

The council recommend that members should insert this standard in their specifications under the title of "The R.I.B.A. Standard Size of Bricks."

1. The length of the brick should be double the width, plus the thickness of one vertical joint.
2. Brickwork should measure four courses of bricks and four joints to a foot.

Joints should be $\frac{1}{4}$ in. thick and an extra $\frac{1}{8}$ in. making $\frac{5}{8}$ in. for the bed joints to cover irregularities in the bricks. This gives a standard length of $9\frac{1}{4}$ in. centre to centre of joints.

The bricks, laid dry, to be measured in the following manner:—

- A. Eight stretchers laid square end and splay end in contact in a straight line to measure 72 in.
- B. Eight headers laid side to side, frog upwards, in a straight line to measure 35 in.
- C. Eight bricks, the first brick frog downwards and then alternately frog to frog and back to back, to measure $21\frac{1}{2}$ in.

A margin of one inch less will be allowed as to A, and a half-inch less as to B and C.

This is to apply to all classes of walling-bricks, both machine and hand-made.

EXPERIMENTS ON THE FLOW OF WATER IN PIPES.

IN a paper recently read before the American Society of Civil Engineers, by Augustus V. Saph, Assoc. Am. Soc. C.E., and Ernest W. Schoder, jun., Am. Soc. C.E., the authors show that experiments confirm the law of variation of resistance proportionate to the power 1.75 of the mean velocity. These were for brass pipes of small diameter. The authors find for galvanised pipes a variation proportional to the power 1.90 (about) of the velocity, indicating that the exponent of V varies with the interior surface of pipe. Mr. Flamant, in the discussion, pointed out that it would be interesting to make experiments with pipes of different materials such as glass, earthenware, wood, wrought iron, to ascertain the effect of the surface, or of an interior coating of paint or tar. The experiments made by the authors of the paper also showed the effect of temperature on small pipes. The confirmation of the increase of flow with the temperature for small pipes is of value. Mr. Mills, another authority, observes, "The effect of temperature upon the flow of water in pipes is a valuable addition to our knowledge. . . The most interesting series of experiments, because it gives the slopes for both high and low temperatures through the greatest range of

velocities, is that upon the smallest brass pipe which is about one-tenth of an inch in diameter. With temperatures of water near 70° Fahr., the slope varies nearly with the first power of the velocity, being contained between $S = 0.129 V$ and $S = 0.138 V$ for all velocities given up to $V = 2.309$ ft. per second. Above this velocity the slope increases much more rapidly. Upon reaching a velocity of 3.3 ft. per second, the slopes come into line with those of higher velocities, which vary with a power of the velocity somewhat less than the second power, being with the very smooth pipe near the 1.75 power . . . with small velocities and the water having the lower temperature has the greater slope, but during the rapid increase that follows, the warm water being less viscous and more mobile, makes this change at smaller velocities than the colder water, and the slope for 75° is greater than the slope for 70°, and both become greater than that for 38.5°. These experiments are useful as showing that the "principal effect of temperature is upon that resistance of motion due to cohesion and adhesion which varies with the first power of this velocity." Many other writers discourse on the subject, which has a practical interest for hydraulicians, though it must be admitted that few large pipes have such smooth surfaces as the small brass ones used in the experiments. It is therefore reasonable to make an allowance for this difference. The experiments also show the uselessness of relying on one formula as applicable to all the conditions found to exist in practice. We refer those interested in the discussion to the report on the *Proceedings of the American Society of Civil Engineers* for September.

THE HALLS OF TARA.

THE Commissioners of Public Works in Ireland refer in their annual report to the excavations at Tara. These excavations, they remark, now happily suspended, or come to an end, have been the source of much anxiety to the public, as may be inferred from the number of questions on the subject put in the House of Commons for some time past. The earthworks at Tara, constituting the only remains of the Royal residence once occupying the hill, are among the structures scheduled to the Ancient Monuments Protection Act 1882. The legal effect of scheduling is to give the Board of Works certain very limited powers for preservation. When a monument is scheduled the Board have power to prosecute, for injury or disfigurement of the ruin, all persons other than the owner, or anyone acting on his behalf and with his authority. As against the owner and any person acting by his direction, "scheduling" gives the Board no remedy, and provides no means for protection of the monument against injury. The Act enables the owner to vest the custody of the monument in the Board, and where this step is taken we are clothed with powers against the owner and his clients similar to those which the mere "scheduling" gives against other persons. The question of vesting the custody of the Tara mounds has been the subject of correspondence, but the owners have not seen their way to vest, and our powers are consequently confined to those which result from the "scheduling" of the monument. In June, 1899, excavations were commenced on a portion of the hill within the scheduled area. The excavations were undertaken by some parties with the consent and authorisation of the owner of the portion referred to, for the purpose of looking for the Ark of the Covenant. No opposition to the work was made by the then occupying tenant. On ascertainment of all the circumstances, we recognised that we were powerless to interfere by legal process, and necessarily confined our action to an endeavour, which was unsuccessful, to secure by persuasions the cessation of the excavations. The excavations continued during the summer, and were renewed in the spring of 1901 to a limited extent. In December of that year the tenancy of the farm on which the excavations had been made was sold, and, in consequence of representations made to the purchaser by our inspector of national and ancient monuments and others, he interposed to prevent further defacement. Some small excavation was commenced in the spring of 1902, but stopped at the instance of the tenant. The holding has again changed hands. Earl Russell, who owns a portion of the hill, has evinced deep interest in the conservation of the mounds on his land, and they are preserved intact.

OBITUARY.

MR. JOHN CALLCOTT HORSLEY, R.A., died at his Kensington residence on Monday in his eighty-seventh year. He was the son of William Horsley, the musician, and a grandnephew of Sir Augustus Calcott, the eminent painter. In the early twenties his first picture was exhibited at the Academy. This was "The Pride of the Village," now in the Vernon Collection. This was followed by a long series, and for many years his contributions were a notable feature at the annual exhibitions. In 1843 his cartoon of "St. Augustine Preaching" gained at Westminster Hall one of three prizes, in the second rank, of £200, and in a competition in the following year he obtained by his two small frescoes a place among the six painters commissioned to execute further samples for the Palace of Westminster. That of 1845, for "Religion," was approved, and the subject was executed in the House of Lords. His well-intentioned protests against representations of the nude figure attracted much public notice. In 1882 Mr. Horsley, who had been a full Academician since 1865, was elected a treasurer of the Royal Academy, and he was for many years active in bringing together the annual winter collection of Old Masters at Burlington House. On attaining his eightieth year Mr. Horsley resigned his position of treasurer, and joined the list of "Retired Academicians." Sir Victor Horsley, the eminent surgeon, is his son.

THE death is announced at the age of 63 of Mr. H. W. YOUNG, M.S.A., of Greymouth, New Zealand, who was a native of Camberwell. He went to New Zealand in 1863, and to the West Coast in 1865 to join his brother, Mr. R. A. Young (now of Westport), who had arrived a few months earlier. Until 1873 the brothers remained on the goldfields, mining and practising their profession. As architects they designed the Greymouth, Hokitika, and other large public schools and ecclesiastical buildings, including Trinity Church, Greymouth. For a couple of years Mr. H. W. Young had been in Wanganui; but in 1886 he accepted the appointment of chief assistant engineer in the colony for the Midland Railway Company, which he held for ten years. Since 1896 Mr. Young has been in private practice as engineer and architect, and in both capacities was associated with nearly every important work or building on the coast. He was one of the first members of the Society of Architects, having been elected in 1884. Mr. Young was a cousin of the Right Hon. Joseph Chamberlain, his mother and Mr. Chamberlain's mother being sisters.

At the last meeting of the Sunderland Corporation the Finance Committee were directed to take steps to borrow £50,170 in respect of the erection of a quarter sessions and police court, fire station, &c., for which the tender of Mr. J. W. White has been accepted.

On behalf of the Local Government Board, an inquiry was conducted by Major C. E. Norton, R.E., at the Council Chamber, Benwell, with respect to the application of the Benwell and Fenham Urban District Council for sanction to borrow a further sum of £3,100 for works of sewerage. Mr. H. W. Taylor, of Newcastle, the engineer, explained the plans.

The Earl of Lathom, Provincial Grand Master of West Lancashire, recently laid, with Masonic honours, the foundation-stone of a new church in the village of Newchurch, near Warrington. The new building will take the place of the old parish church, which was burned down in April. In that church the notorious Colonel Blood, who attempted to steal the Crown jewels from the Tower of London, was married 250 years ago. The Bishop of Liverpool announced that £6,000 of the sum of £7,000 required for the new building had already been subscribed.

The parish church of Allington, Kent, has been reopened after the completion of mural decoration in the chancel and Lady-chapel, carried out by Mr. Godfrey Gray.

Whitby Urban District Council have decided to apply to the Local Government Board for their sanction to the raising of a further electric lighting loan of £5,000 for the extension of cables and additional plant, in connection with the electric light undertaking.

There are immense forests of Aleppo pines in Algeria, which have up to now been considered of little value. The suitability of this wood for road paving and for timbers for mines and telegraph posts may have the effect of enhancing the value of these forests.

PROFESSIONAL AND TRADE SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—At a meeting of this society held in the Free Library, William Brown-street, on Monday evening, Mr. Peter Cowell, librarian, read a paper on "Venice." A number of lantern slides were exhibited, and the address dealt with the beauties of Venice from an architectural point of view. On the motion of Mr. Rees, seconded by Mr. Grayson, a vote of thanks was passed to Mr. Cowell. The chair was occupied by Mr. John Woodfall.

CHIPS.

It is proposed to build on the site of the disused Malone Felt Works at Belfast a People's Palace, at a cost of £12,000. The hon. secretary and architect is Mr. J. W. Roome, M.R.I.A.I., M.S.A., of that city.

The foundation-stone of the King's Sanatorium for Consumptives at Lords Common, near Midhurst, will be laid on Nov. 3 by the King.

A practical proof of the interest taken by Lord Curzon in the restoration of ancient monuments is the grant-in-aid of Rs.14,372 just sanctioned from Imperial revenues for archaeological work in Bengal. The grant is intended for repairs to the tomb of Buktari Khan near Channpur, Shahabad, for repairs to the ancient remains at Pandua and Tribeni in Hooghly, and for re-erecting the broken Asoka pillar at Rampurwa in Champaran.

On the recommendation of the waterworks committee, the corporation of Manchester will seek powers in the next session of Parliament to construct a reservoir 105 acres in extent at Heaton, of which area 45 acres will be taken out of the public recreation-ground known as Heaton Park.

A great canalisation scheme is being initiated in the Midlands by which it is intended to link Manchester and Liverpool with the Potteries, Wolverhampton, and Birmingham. A surveying party are making an exhaustive examination of the levels with a view to the launching of the scheme in the course of a few months.

The central tower of Truro Cathedral will be completed by the end of November or the early week of the closing month of the year.

Torquay Town Council, at a special meeting, have decided by 26 votes to 3 to accept proposals by the Dolter Electric Traction Company for the installation and maintenance by the company of electric tramways in the town. The system to be adopted is that of surface contact. The power main is underground, being connected with the surface every few yards, and the tram picks up the current by means of a skate, which touches the studs connected with the main, and thus transmits the power to the tram motors.

Mr. R. H. Bucknell, Local Government Board inspector, has held an inquiry at Ossett, into an application of the corporation for sanction to borrow £1,200 for the purchase of land in Church-street, and £3,750 for the erection thereon of a refuse destructor, £210 for a cart shed and mortuary on land in Ilkworth-street, and £700 for a contribution towards the construction of a new bridge over the River Calder at Healey.

A Primitive Methodist church and schools in Harehills-avenue, Leeds, built at a cost of £6,500, were opened on the 7th inst. The church, designed by Mr. W. H. Dinsley, of Chorley, and built by Mr. Walter Lolley, of Leeds, is cruciform in plan and in the Gothic style. With the exception of a small gallery, the seating accommodation is on the ground floor. The rostrum faces the main entrance, and behind it is the orchestra. There is accommodation for a congregation of 550. The windows, glazed with lead lights, have been specially designed. The roof is partially open, and all the visible timbers are stained and varnished. The internal walls have broad dadoes. There are electric lights throughout, and the heating is by hot water. The school will seat 300, but it also comprises four classrooms, an infants' room, and a vestry.

A special meeting of the parishoners of St. Peter's Church, Burnley, was recently held to consider proposed alterations at the church. These include the taking out of the west gallery, the erection of a clergy vestry, the placing of the baptistery under the tower, and the installation of the electric light, &c., estimated to cost about £4,000. The Bishop (Dr. Hoskyns) presided, and explained that there was a recommendation from the church officers to modify the scheme now in hand, and to pull down the south gallery and extend the north gallery to the west end of the church. This would mean a net loss of 76 sittings. The recommendation was adopted, and it was also decided to remove the pulpit from the north to the south side of the church.

Mr. W. J. Potter, of Ashford, Kent, has been elected district surveyor to the rural district council of South Stoneham, Hants.

Building Intelligence.

BRISTOL.—An important block of business premises is about to be erected in College Green. Messrs. Wilkins and Sons, the contractors, are already demolishing the old premises, which have stood on the site for nearly two centuries. The new buildings comprise new premises for Messrs. Hughes and Son, estate agents, and an extension of Mr. P. E. Gane's furnishing establishment. The latter will be treated to correspond with the present front of Mr. Gane's central block, but for Messrs. Hughes and Son's frontage a design has been prepared by Messrs. La Trobe and Weston, F.R.I.B.A., of Bristol. The ground floor, of red Swedish granite, treated with severe simplicity, will support two stories of plain Bath stone leading up to a richly-ornamented attic story surmounted by a carved pediment. Each of the two stories over the ground floor has a circular bay window in the centre, with small windows on each side; between these will be a panel of gold mosaic, and on each side canopies of beaten copper-work. Mr. Gane's new premises will comprise on each of the four floors a showroom, about 80ft. in length. During the summer Mr. Gane has already added two new showrooms in the rear of College Green each of 90ft. by 23ft.

GOLDENACRE, EDINBURGH.—St. Serf's Established Church, Trinity and Ferron-road, Goldenacre, was opened on Saturday. It will hereafter be completed by the additions of another transept and the chancel. The building as it at present stands is in 15th-century style, and consists of a nave with side aisles, divided by red polished stone pillared arches, and one transept, also a temporary chancel, which occupies a portion of the chancel arch, the remainder being filled in. The roof of the nave is circular timbered, resting on the pillared arches, the principal timbers being supported on capped corbelled trusses. The entrance hall, over which is placed a loft gallery facing the chancel, is divided by a carved and glazed wooden screen from the church. The exterior of the church, which is in red and white stone, is heavily buttressed, and pierced by many richly foliated tri-light windows. The electric lighting is carried out on modernised Mediaeval lines. Opal open cups spring from black suspended ring girandoles, which enhances the severe style of the building. The chair sitting accommodation is for over 600, but when complete the building will seat about 1,000. The church, which was illustrated in our issue of December 6, 1901, by plan and perspectives of exterior and interior, has been erected from designs by Mr. George Watson, Edinburgh, whose design was selected in competition by the assessor, Mr. J. MacVicar Anderson, of London.

LITTLE ILFORD.—In the City of London Cemetery, Little Ilford, on Wednesday, Mr. R. W. Edwards, the chairman of the Sanitary Committee as the Burial Board for the City of London, laid the foundation stone of a crematorium, which will be erected at a cost of £7,000. The design provides for a hall 27ft. in length by 24ft. in width for the mourners to assemble in, with a large waiting-room adjacent and leading from the hall. The cremating chamber will be at the rear of the hall, and will be of sufficient size to admit of two cremating furnaces being erected. At the present time, however, it is intended to erect only one furnace, the flue of which will be carried up in the centre of a tower about 80ft. in height. The design of the crematorium is Gothic in style, and is intended to harmonise with the existing chapels and buildings in the cemetery. The designs were prepared by Mr. D. J. Ross, M.Inst.C.E., the city engineer, and the contract has been taken by Mr. B. E. Nightingale, Albert Works, Albert Embankment, S.E.

LONDON COUNTY COUNCIL.—At their meeting on Tuesday the Council reversed the decision of the Bridges Committee to accept the tender of Messrs. Heenan and Froude, at £154,584, for the building of Vauxhall Bridge, and accepted the tender of Mr. Charles Wall, of London, at £142,942. It is to be regretted that without discussion the members declined to alter the line of the Strand frontage, near the eastern corner of Aldwych, as suggested by the Further Strand Improvement Committee. It was reported that the annual rental value of the sites offered for sale by auction last week was, as regards the Holborn to Strand scheme, £11,000 a year.

MIDDLESBROUGH.—On Saturday afternoon

Lady Constance Emmott laid the corner-stone of the new Church of St. Michael and All Angels at Middlesbrough. The sacred building is being erected in Waterloo-road, to the north of the Albert Park, in one of the portions of the town which has sprung up with such rapidity during the past year. Mr. Wm. Duncan, of Middlesbrough, is the architect for the new building, the tender for the erection of which has been let to Messrs. Bastiman Bros., of Middlesbrough, for £5,430; but the fittings, &c., will bring up the total cost of the undertaking to fully £6,000. The new church will provide seating accommodation for 500 worshippers.

OXFORD.—During the Long Vacation which ended on Friday night various improvements have been carried out in the University buildings. Magdalen College hall has now the new timber roof which has long been desired. The work has cost several thousands of pounds, which was provided by a former Fellow of the College, Mr. H. E. F. Garnesey, who unfortunately died the very day the contractor began. The plaster ceiling which has been removed was placed in the College between 1790 and 1800 by Wyatt. Designed by Mr. G. F. Bodley, R.A., the new timber roof is of the flat pitch which was common at the period when the College was built. When the plaster was removed from the walls at the east and west ends, just before the new roof was to be erected, indications of the original timber roof were discovered. These proved that the new roof is a fairly exact restoration of the one existing at the end of the 15th century. A window which had been covered in at the east end of the hall was discovered, and this has now been restored from the remains of the tracery and filled with stained glass. An enlargement has been made at Somerville College. The scheme includes a library capable of containing 30,000 volumes. The new buildings are from the designs of Mr. Basil Champneys, and are in the Renaissance style. In the centre is a loggia, 40ft. long by 13ft. wide, connecting the old and the new buildings. At University College, Mr. H. W. Moore, architect, of Oxford, was some time ago instructed to prepare a report upon the possibility of removing the plaster vaulting from the College dining-hall to allow of the original roof being opened out. His report was favourable, and the work is being carried out. The hall is also being extended about 20ft. A new building providing twenty-four additional sets of rooms has been added to Hertford College. There has been a great extension of the electric light throughout the University, and the illuminant has now been installed at Merton, Queen's, and Mansfield Colleges, Christ Church Hall, and Pembroke College Chapel.

SALFORD.—The Countess of Aberdeen opened on Saturday the Girls' Institute, the cost of which (about £8,500, exclusive of site and fittings) was defrayed by the trustees of the late John Harling. The building which is on the Regent Road Barracks site facing Huddart-street, is in the Renaissance style, and is of red brick, with buff terracotta dressings, from Northwich. There are a restaurant, a gymnasium, laundry, washhouse, kitchen, scullery, pantries, and a cookery classroom on the ground floor. Above these is a large assembly hall, with ten classrooms opening from it. The committee-room is on this floor. The hall is lighted through a domed lantern, which forms a feature of the building both internally and externally. The institute is fitted with hot and cold water supply, hot-water heating apparatus, and a separate system for steam cooking, and is lighted by electricity. There is a house for the caretaker, and an emergency exit has been provided in case of panic. The architects were Mr. J. Earnshaw and Son, Manchester, and the contractors Messrs. Burgess and Galt, of Ardwick, Manchester.

ST. HELENS, LANCs.—The new buildings erected at the corner of North-road and Corporation-street, St. Helens, as the headquarters of the St. Helens Young Men's Christian Association, were opened on Friday by the Earl of Aberdeen, G.C.M.G. The premises have been erected in the Renaissance style from plans prepared by Messrs. Briggs and Wolstenholme, of Liverpool and Blackburn, the work being carried out by Mr. Joseph Ellison, builder and contractor, St. Helens. Ample accommodation is provided for clubs in the way of rooms for dressing, storage of cycles, lavatories, &c. On the first floor are the reception-hall, inquiry office, secretary's office, newsroom, library, and lounge. The

library and lounge have been furnished in fumed oak and upholstered in antique tapestry with a polished block floor. One of the main features of the building is the "Windle-Pilkington Hall," a room providing seating accommodation for 220 persons. Several tradesmen's lock-up shops have been constructed beneath the association's rooms. The top of the building has been formed into a roof-garden and open promenade, and plants and shrubs will be provided. Seats are also provided, and a view of the town and surrounding districts can be obtained. The total cost has been about £9,000, while the furnishing has taken an additional £500.

SOUTHGATE.—On Saturday the foundation-stone of the church of St. John the Evangelist, Palmer's Green, was laid by Mr. V. E. Walker. Mr. J. Oldrid Scott, F.S.A., is the architect, and it is proposed to build the chancel, side-chapel, vestries, and two bays of the nave, thus providing accommodation for about 400 worshippers. The cost of this will be about £9,000. In the previous week the foundation-stone of the church of St. Andrew (to take the place of a worn-out iron church) was laid in the northern part of the parish of Southgate. Three bays of the nave, with accommodation for about 300 people, are being built. The architects are Messrs. A. R. Barker and Sen. The total cost will be about £3,500.

SWANSEA.—The new harbour offices at the corner of Adelaide-street and Somerset-place were opened by the mayor last week. The buildings are faced with red brick, and white stone is employed for dressings. A square tower covered by a dome of copper, surmounted by a gilded vane representing a ship of antique design, rises near the angle. The upper part is decorated with sculptured figures representative of "Discovery," "Commerce," "Engineering," and "Navigation," and the pediments of the building are also embellished with seated female figures. The sculpture and carving have been carried out by Mr. Houghton, of Swansea, and Mr. T. Jones, of Cardiff. The contractors are Messrs. Lloyd Brothers, of Swansea, who have erected the buildings from the designs of Mr. Edwin Seward, F.R.I.B.A., of Cardiff. A wing contains further offices, together with new premises for the Capital and Counties Bank. The chief features of the interior are the range of offices for the general superintendent, engineer, solicitor, accountant, &c., with their staffs, and the shipping department. The approach lobbies and corridors are fitted with screens in teak. On the first floor is the board-room, with a wagon-head roof containing plaster decoration, and surrounded by a high dado of polished teak. The windows are decorated with medallions in stained glass, indicating the engineering and shipbuilding arts, &c., and a large lunette at one end will be filled by decorative painting, representing ancient shipbuilding at Swansea, by Mr. Morton Nance, of Penarth. Mr. William David has acted as clerk of works.

WINCHESTER.—The City Museum has had many peregrinations, and has now been finally placed in a suitable and handsome structure in the Domestic Gothic style, designed by Mr. Nisbett (Colson, Nisbett, and Farrer), of Winchester. The structure stands just in the route of visitors to the cathedral, and is very central. The museum in its first stage was in the old schoolroom of Richards's famous Hyde Abbey School, thence it moved to the governor's house of the old gaol on Jewry-street, then to the garret-like rooms under the skylights of the Guildhall, and now, at last, it occupies a house in the Square. The new structure has been erected by the corporation to provide accommodation for the collections formerly housed at the Guildhall, now required for the extension of the municipal offices. The building is on the site of the old Mechanics' Institution, a construction consisting very largely of lath and plaster, originally erected as a market room, and used later as a theatre. Even then, however, the building was not entirely new, as several of the old oak beams and some columns of the earlier market house were found incorporated in the fabric, and where possible these have been preserved in the new museum. Close to the site Dame Alice Lisle was beheaded, of which event it is proposed to place a record in the museum. The new building consists of three stories, with one large room at each level, and to economise space the stairs are placed at the end near the entrance. The room on the ground floor is 10ft. by 31ft., and is lighted by three windows on each side. This room will contain Roman and

Medieval antiquities, and the upper the varied curios found in local museums. The room on the first floor is about the same size, and is devoted to the display of the fine Northesk Loan Collection of prehistoric stone and other implements, as well as weapons, &c., illustrating the handiwork and usages of modern savages. The top room is formed in the roof, and, in addition to three windows on the north side, it has a top light. The old cases which contained the Natural History collection at the Guildhall have been rearranged, and it is hoped in time will be refilled with specimens of local interest. It is also proposed to arrange the Geological specimens in this room. Externally the building is faced with flint, with dressings to windows, doors, and quoins of Monk's Park stone. The opening ceremony took place on Thursday afternoon in last week.

CHIPS.

Messrs. Dorman, Long, and Co., Ltd., of Middlesbrough, who have secured a large order for the Indian State Railways, have now commenced rolling, at their Port Clarence Steel Works, near Middlesbrough, a large number of bull-headed rails. The same firm, in conjunction with Messrs. Bolckow, Vaughan, and Co., of Middlesbrough, have also been successful in securing important contracts for the permanent way material required for 200 miles of railway in South Africa, or a total of about 23,000 tons of rails.

The city council of Newcastle-on-Tyne adopted at their last meeting a scheme for the erection of artisans' dwellings in the Ouseburn district, on a site between Walker and St. Lawrence-roads, and estimated to cost, including land, compensation, streets, and buildings, £23,670. They also decided to seek Parliamentary powers next session to construct nine additional routes of electric tramway extension. The city engineer's estimate for construction was £133,850, and the general manager's estimate for electrical equipment was £156,476—a total estimated cost of £290,326.

Messrs. J. B. Joyce and Co., Whitchurch, Shropshire, have been favoured with the order of a large striking turret clock, to be erected in the stable yard at Hardwicke Grange, Shrewsbury. The same firm are also making a striking clock for the new church of St. George, Barbourne, Worcester, and are now fixing clocks at Rainford Church, St. Helens, and Silk Willoughby Church, Sleaford.

Mr. Chas. F. Hayward, architect, district surveyor for Bloomsbury, St. Martin, Soho, and Covent Garden, has removed to 50, Great Russell-street, W.C.

The church of Holy Trinity, Frogmore, near St. Alban's, was reopened last week after the addition of an organ-chamber to the north transept, and the reconstruction and removal of the organ. Messrs. Blomfield prepared the plans for the alteration to the organ-chamber, and in accordance with these Messrs. Boff Bros. executed the work. Messrs. Speechley, of London, were intrusted with the readjustment of the organ.

The memorial to Huntingdonshire men who fell in the late South African War, erected at the corner of George-lane, Huntingdon, near All Saints' Church, on property belonging to the town, will be opened to-day, Friday, by General Lord Grenfell. The monument was designed by Messrs. Davies and Scott Gatty, and represents a figure of St. George, the Patron Saint of England, upon a pedestal of Portland stone, on which are carved the names of the soldiers, and surmounted by a hexagonal roof of oak, overlaid with copper, crowned by a lantern, also of copper.

New offices have just been built for an accountant in Orford-place, Norwich, from plans by Messrs. C. J. and F. W. Skipper of that city. The front is of terracotta, harmonising with the adjoining savings bank, and the style of the premises, which are three stories in height, is French Renaissance. Mr. J. S. Smith, of Norwich, is the builder, and the terracotta work was supplied by Messrs. Doulton and Co., of Lambeth.

Letters of administration of the estate of Mr. Herbert Ford, F.R.I.B.A., of Homeleigh, South-row, Blackheath, and 21, Aldermanbury, have just been granted, the value of the property being £22,547 4s.

The partnership heretofore subsisting between P. B. Houghton and F. C. R. Johnson, architects, Chesterfield, under the style of Houghton and Johnson, has been dissolved.

On his retiring from the post of manager to accept a like position at Birmingham, Mr. Alfred Baker has been presented by the indoor staff of the London County Council's South London Tramways with a tantalus, a drawing-room clock, and brass ornaments, together with an afternoon tea service and a case of spoons for Mrs. Baker.

Engineering Notes.

LONDON ELECTRIC TUBE RAILWAYS.—At the half-yearly meeting of the Underground Electric Railways Company of London, held on Friday, the chairman, Mr. Yerkes, explained the measures which are being taken to guard against an outbreak of fire on the lines controlled by the company by employing only non-combustible materials, cement being used in place of wood for all platforms, and iron for staircases. The existing stations on the District line will be remodelled on this principle. As to new works, Mr. Yerkes mentioned that the underground work on the Baker-street and Waterloo line between Baker-street and Waterloo is practically finished, and attention is now being turned to the completion of this line. A connection will be made between this line and the District of that at the Charing-cross Station of the District Railway. The Baker-street and Waterloo Company have decided to extend their lines from Waterloo Station to Elephant and Castle, and the work there is now being pushed forward rapidly, while the extension from Baker-street to Edgware-road is about to be commenced. When this latter is finished, the line will be still further carried on to Paddington. The other lines controlled by the company, the Great Northern, Piccadilly, and Brompton, and the Charing-cross, Euston, and Hampstead, are also, he declared, making good progress.

The urban district council of Stourbridge have adopted a scheme of electric light installation. It was decided to apply to the Local Government Board to sanction a loan of £16,000 for the works, and to appoint Mr. J. B. Clarke as electrical engineer at a salary of £200 per annum.

A general meeting of the Competition Reform Society, of 10, Gray's Inn-square, London, W.C., will be held on Thursday, the 29th inst., at 9, Conduit-street, W., at 5.30 p.m., to consider the resignations of three members of the committee and the events which led thereto, and to elect new members to the committee.

Mr. Alfred J. Dunn, A.R.I.B.A., has, on account of pressure of work away from Birmingham, resigned his lectureship in building construction and drawing at the Birmingham Municipal School of Art (elementary, advanced, and honours). The committee, at their meeting on Monday afternoon, appointed as his successor Mr. Francis B. Andrews, A.R.I.B.A.

The South Canterbury Hospital, Timaru, New Zealand, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Mr. R. S. Oldham, who has been in the service of the Trust for nine years, has been appointed resident engineer for the construction of the new dock works at Swansea at a salary of £300 a year, rising to £400 by £20 increments.

The death occurred last week at his house in Rossie-street, Arbroath, at an advanced age, of Mr. Charles Gordon, master builder, of that town. For over fifty years Mr. Gordon had been successively a deacon and elder in Ladylow U.P. Church.

The new fever hospital at Colinton Mains, which is to be open for the reception of patients next week, was officially inspected on Friday by members of the Edinburgh Town Council. The members were accompanied by Mr. Morham, the city superintendent of works.

Mr. Richard Hirst, who for ten years has been Lloyd's engineer surveyor at West Hartlepool, has been promoted to the position of senior engineer surveyor for the port of Liverpool. Mr. T. S. Warren, the principal ship surveyor at West Hartlepool, will be transferred to Sunderland.

During the harvest festival, held at the parish church of St. Bartholomew, at Crewkerne, on Sunday, the Ven. Archdeacon W. H. Askwith dedicated the costly new reredos and altar which have just been presented to the church. The reredos is of Ham Hill stone; the central panel, measuring 7 ft. 6 in. by 3 ft. 6 in., contains a reproduction of the Last Supper. The altar is of oak, resting upon steps, and a foot-pace of Devonshire marble. Both works are by Messrs. Harry Hems and Sons, of Exeter, who also executed the oak stalls and a statue of the patron saint in the south-west porch. The architect was Mr. J. Howard Gaye.

The casting of a bronze memorial statue to Prince Christian Victor, which is to be erected at Windsor, took place last week at the bronze foundry of Messrs. Hollinshead and Burton at Thames Ditton. The statue has been modelled by Mr. W. Goscombe John, A.R.A.

COMPETITIONS.

MULREADY PRIZE.—The council of the Society of Arts offered, under the terms of the Mulready Trust, a gold medal, or a prize of £20, for competition among students of the Schools of Art in the United Kingdom at the annual competition for the present year. The prize was offered to the student who obtained the highest awards in certain subjects—all life studies. This prize has now been awarded to Thomas Corrie Derrick, of Queen's-road School of Art, Bristol. The previous awards of the Mulready Prize were made in 1884, 1893, and 1896.

TAUNTON.—At the last meeting of the town council the free library committee reported that the trustees had offered prizes of £30, £20, and £10, in order of merit, for the three best designs for a free library, to be erected in Corporation-street, immediately opposite the municipal buildings. Conditions of competition were issued, and 81 sets of designs were sent in. The first prize was awarded to Mr. A. Colborne Little, of 9, Gray's Inn-square, London, and his revised designs were approved by the council. Photographs of the designs will be forwarded to Mr. Carnegie (the donor of £5,000 for the erection of the building), with plea for his promised contribution, so that the building may be proceeded with at once. The education committee presented a scheme for the formation of a county and borough joint committee for science and art, and the building of a new school of art in Corporation-street. It was proposed to erect on a site in Corporation-street, to be purchased from the town council, a building to be used as a school of art, the cost of which had been roughly estimated at from £2,000 to £3,000. The committee asked the council to authorise them to proceed with the necessary arrangements for completing the scheme and bringing it into operation. This recommendation was adopted by the council.

Inscriptions in English and Welsh have been placed on the Celtic cross erected by the Hon. F. G. Wynn on Llanddwyn Island, near Carnarvon Bar. The cross is intended to commemorate St. Dwywen, the patron saintess of the island, which has on it the ruins of an ancient abbey. It stands about 14 ft. high, and on one of the blocks are the words "Remember the dead who lie around; remember you are on holy ground." The work was executed by Messrs. Hugh Jones and Co., Carnarvon.

Two new underground conveniences have just been constructed by the Lambeth Borough Council, the one situated on the Surrey side of Westminster Bridge, opposite St. Thomas's Hospital, the other at the junction of Loughborough-road with Coldharbour-lane. Both were constructed under contract by Mr. J. Parsons, of Waterloo-road, from plans prepared by Mr. Henry Edwards, the borough engineer. The contract for the structure at Stangate was £3,298 and at Loughborough £2,495.

A conference has been held of representatives of the Middlesbrough Corporation, the urban district council of Ormesby, and the urban district council of Normanby, at which Mr. Robert Hammond, of London, consulting electrical engineer, attended, and reported on a scheme for the authorities concerned undertaking themselves the proposed considerable tramway extensions. The conference recommended the councils represented to adopt the scheme, and to take all such steps as may be necessary for carrying the same out.

Plans have been approved by the Hull Corporation Property Committee for the erection of a bridge over the River Hull at Stoneferry, which is to cost £36,000.

The Great Western Railway Company will promote a Bill in the ensuing session of Parliament to carry out extensive work, whose effect will be to place Swansea on the main line and open up the rich anthracite coalfield north of the town.

The foundation-stone of the new free library in the People's Park at Limerick was laid by Mr. Carnegie on Tuesday. Mr. Gaze F. Beckett, of Dublin, whose design was recently chosen in competition by Mr. Ashlin, the assessor, is the architect.

A public meeting was held on Monday at the Stamford Hill Congregational Church in furtherance of the proposal to convert the Springfield Estate, Upper Clapton, into a public park. It was explained that £40,000 was required in order that the park might be secured. Towards this sum the Hackney Borough Council had promised £10,000 and the London County Council £20,000, so that £10,000 had still to be secured. The London County Council would bear all the expenses of the upkeep. It was resolved to form a committee to take the necessary steps to obtain the balance of the sum required.

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ILLUSTRATIONS.

CONGREGATIONAL CHURCH AND SCHOOLS, NORTHAMPTON.—
GARDEN HOUSE AT WALMER LODGE.—GARDEN HOUSE AT
COURTLANDS.—BUNGALOW AT WAMBROOK.—KING'S PARK
SCHOOL, DALKEITH.—CX. BROMPTON ROAD, S.W.—PRO-
POSED HOUSE AT WITLEY.—TECHNICAL SCHOOLS, SUTTON
COLDFIELD.

Our Illustrations.

CONGREGATIONAL CHURCH AND SCHOOLS, ABINGTON
AVENUE, NORTHAMPTON.

This is a design prepared by Messrs. C. Dorman and Son, architects, of Northampton, for a chapel and schools to be erected in a residential part of the town, and, when completed, will form a compact block of buildings well adapted for the purpose intended. The ground, which has streets on three sides, is 150ft. long by 100ft. deep. The main body of the church is a hexagon, with transepts on three sides and galleries over: the whole is arranged to seat 1,000 people. The entrances are placed at four corners, with staircase to galleries. In the rear are a pastor's, deacons', and ladies' vestries, with necessary conveniences. The schools, which are already built, contain, on the ground floor, a large room, 44ft. long and 39ft. wide, an infants' room, 29ft. by 21ft., two classrooms, each 10ft. 6in. square, lobbies, staircases, &c. On the first floor is the church parlour, 43ft. long and 37ft. wide, with two large classrooms and lavatory accommodation. There are kitchen, caretaker's store, and heating chamber in the basement. Local bricks are being used, with Bath stone dressings. The interior woodwork is in pitch pine, varnished. The whole scheme is estimated to cost £10,000.

GARDEN HOUSE AT WALMER AND PERGOLA
AT COURTLANDS.

THESE two colour drawings represent architectural detail in two of Mr. Mawson's recent garden schemes. The Garden House at Walmer Lodge is erected at the end of a somewhat extensive terrace, and is built of brick rough-casted and whitened, and the dressings are of freestone. The Pergola at Courtlands, Goring, is also part of another terrace scheme, and, as shown, suggests a fair treatment of square columns rough-casted, with heavy cross-beams, upon which are trained to grow all manner of climbers to form a shady walk leading up to a pavilion. These drawings both appeared in this year's R.A. Exhibition. The drawing of the Pergola at Courtlands is by Mr. C. E. Mallows, while the one of Walmer Lodge is by Mr. A. N. W. Hodgson. The architect is Mr. Thomas H. Mawson, of Conduit-street, W.

BUNGALOW AT WAMBROOK, NEAR CHARD.

THIS bungalow has been built on an estate some three miles from Chard. The materials used are Wellington dark red bricks, with Ham Hill stone dressings. The roofs are covered with hand-made tiles from the Somerset Trading Co.'s yards, Bridgwater. The natural contour and surroundings of the site lend themselves successfully to the general effect of the style selected. The work has been carried out by Messrs. Harris and Woolcott, contractors, Chard, from the designs, and under the superintendence of, the architect, Mr. Arthur W. Yeomans, of Chard, Somerset.

KING'S PARK BURGH SCHOOL, DALKEITH.

THIS new school has been erected on a site acquired by the board in a central position lying between Croft-street and the King's Park. The new buildings at present consist of a main block two stories high to accommodate an infants' department, senior and junior elementary departments, and a secondary department. There are ten classrooms, five on each floor, all entering from one side of a wide corridor running the whole length of the school, with boys' porch at one end, and infants' porch at the other. Adjoining the boys' porch is a room for the janitor with kitchen range, and of sufficient size for use as a lunch-room for children coming from a distance. The staircases are on the other side of the corridor, where there are also ample cloak-rooms for pupils, and staff-rooms for the teachers on each floor, and an entresol floor. There are besides other entrances for boys and girls at the bottom of each staircase. The corridors are lofty, being carried nearly the same height as the classroom ceilings, which are about 15ft. high, and special attention has been paid to light and ventilation throughout, the result generally being a feeling of airiness and spaciousness which would tend to make the building among the healthiest of its kind. The main block has been designed so as to permit of the addition of further classrooms without disturbing the carrying on of school work, and provision has also been made for connecting the main building by means of a corridor with a separate building for which space has been reserved in the playground, alongside Croft-street, which could be used either entirely as secondary department or higher grade school, as future requirements necessitate. The classroom accommodation at present provided is for 610 pupils; but the administrative departments, staff rooms, cloak-rooms, &c., have been designed to cope with future extension. The site permitted of playgrounds of ample proportions, with entrances from both Croft-street and Parkside-place, and there are the usual offices and playsheds for boys, girls, and infants. The main front of the school containing the classrooms is well seen from the road leading from Eskbank Station to Dalkeith. The walls are of stone, faced with cream-coloured coursed rubble, with bands at the sill and lintel levels, cornice course, and high dormer windows to the principal classrooms, with gables or pediments projecting above the general wall head level, and breaking up the sky line, such features and other hewn work being in red sandstone from Moat Quarry. The roofs are covered with green slates from Buttermere, ridged with red tiles; and in the centre of the main block is a large ventilator, finished with an open colonnaded cupola. The building is heated by means of hot-water pipes and ventilating radiators on the low-pressure system, worked from an apparatus in a basement heating-chamber, and hot-water service is provided for the teachers' and pupils' basins. The approximate cost, including boundary walls, laying out playgrounds, furnishings, and fittings, is £12,000. The principal contractors have been as under:—Mason work, Mr. Stephen Hair, Dalkeith; steel and ironwork, Messrs. Wm. Little and Sons, Edinburgh; fire-resisting floors, Messrs. Stuart's Granolithic Company. The work has been carried out from the designs and under the superintendence of Mr. Thomas T. Paterson, architect, Edinburgh; and Mr. W. G. Peddie was the clerk of works.

NO. CX. BROMPTON ROAD.

THIS building was completed in July last, and, as will be seen by referring to the plans, the ground floor consists of large butcher's shops, with meat store at rear and offices at side. In the basement a large cold store, sausage-making room, salting room, and washing space, &c., is provided. The whole of the upper part of building has been given over to the manager's apartments. The building was erected by Mr. A. R. Pocock at a cost of over £3,000, and Messrs. Syme and Duncan, of Beckenham, were the builders. The architects are Messrs. Blangy and Van Biars, 19, Old-square, W.C.

PROPOSED HOUSE, WITLEY.

MR. W. H. SETH-SMITH, F.R.I.B.A., is the architect of this house, but we have received no further particulars from him.

BOROUGH OF SUTTON COLDFIELD TECHNICAL SCHOOL.

THE designs for the above school were selected in limited competition, and the buildings are now

approaching completion. The levels of the ground have made it possible to obtain direct light from the rear for practically the whole of the basement. The scheme provides a very complete school for a small country town. It consists of a workshop for twenty-five pupils, with suitable workbenches of the London School Board pattern, lathe, tool cupboards, &c. The cookery school for practical work and demonstration contains three tables, each for six students, and has in addition a range, gas-stove, laundry-stove, sink, dresser, &c. On the ground floor is master's room, classroom, boys' cloakroom, lecture-room for 100 students, with preparation-room, and lecturers' table, black-boards, lantern arrangement, &c. The chemical laboratory provides accommodation for twenty-five pupils, and contains working-tables, fume closets, sinks, &c., of the latest pattern. The physical laboratory provides accommodation for twenty-five students, with balance-room adjoining. The upper floor contains art-room, modelling-room, and lavatories and cloakrooms for female students. The materials employed are 2in. hand-made bricks from Oldbury, the dressings are Box Ground and fine Hollington, and the style of architecture falls in with the older buildings in the town. The total cost, including fittings, will be less than £5,000. The architects are Messrs. Crouch and Butler, of Birmingham; and the builders Messrs. Turville and Son, of Sutton Coldfield.

CHIPS.

The parish church of Malins-Lee, Salop, was reopened last week after restoration at a cost of £800.

It has transpired that the statue of Queen Victoria, about to be erected on the Promenade at Southport, the order for which was given to Mr. G. J. Frampton, R.A., has been cast by a firm of German bronze founders. The contract price was £1,750.

The public free library at Lockerbie, N.B., was formally opened on Friday. It has cost £2,850.

At the Conference of the Lw Society at Liverpool, on Wednesday, a discussion took place on the Land Transfer Act of 1897, under which there is now compulsory registration of titles for the County of London. The Act was criticised as a failure, it being stated that it was costly and useless, and a resolution was adopted asking for an independent inquiry into its working.

On Monday week the Bishop of Lincoln reopened the ancient parish church of St. Nicholas, Haxby, which has been for some time past undergoing restoration. The bells have been recast, the tower improved, and the church entirely re-seated with oak seats in place of the old-fashioned square pews.

The Bishop of Southwark on Saturday consecrated the new church of St. Silas, which has been erected in Waverley Park, Nunhead. The new church is constructed of stone in the Perpendicular style, and has a pitch-pine roof. It has seating accommodation for 750. Nearly £7,000 of the £8,000 required has been raised.

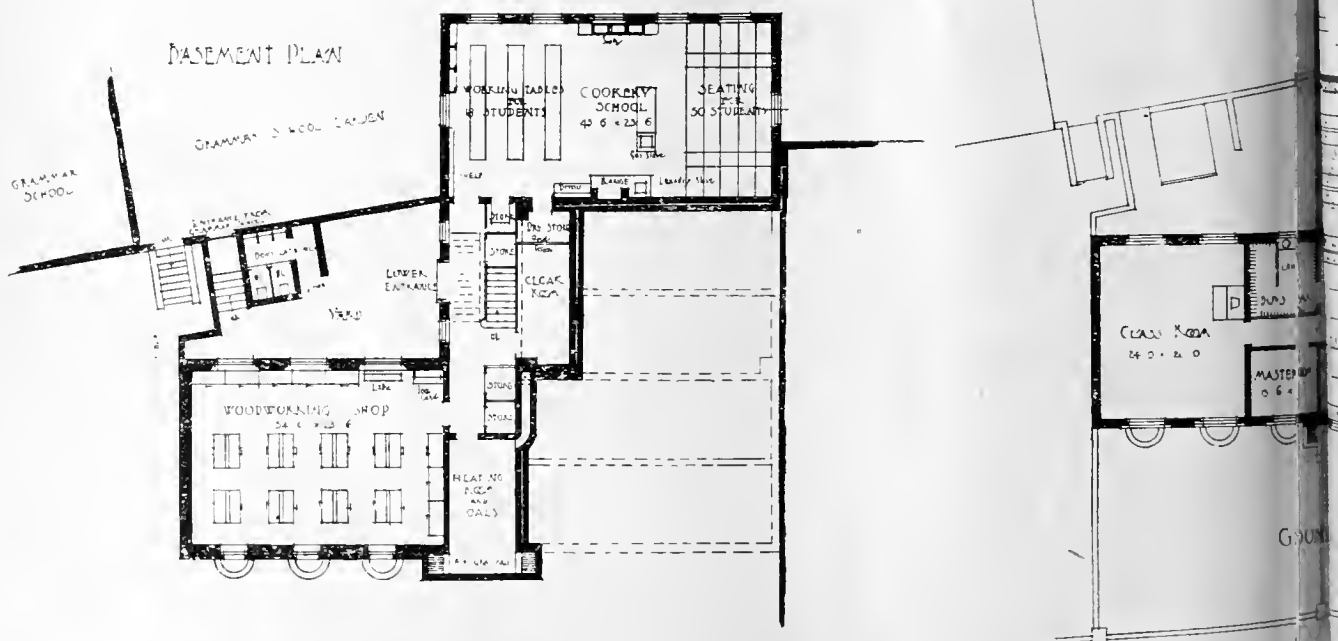
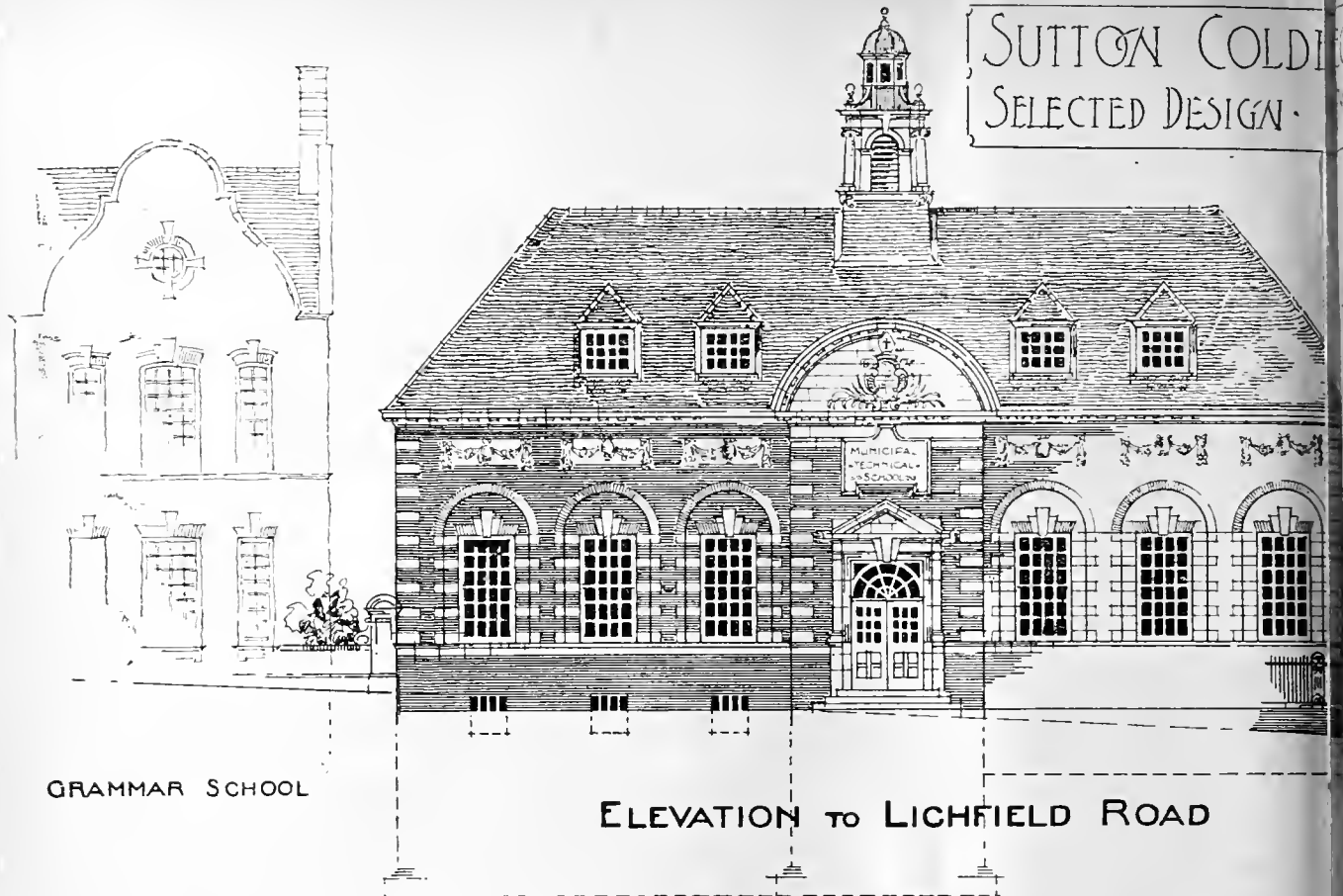
The Bishop of London has fixed Wednesday next (St. Simon and Jude) for the consecration of the church of the Holy Trinity, Kensington Gore. The church, which has been designed by Mr. G. F. Bodley, R.A., is constructed of stone externally and internally. At present the nave, chancel, and one aisle are built. The double aisles on the north side, which will be a great feature of the building, will be added when sufficient funds come in.

Two paintings by Miss Emily Ford, representing "The Three Wise Men" and "The Nativity," have been placed in St. Agatha's, Landport, in memory of their brother, the late Father Dolling, by the Misses Dolling. The paintings were originally executed at his desire for his school at St. Saviour's, Poplar. Miss Ford is engaged upon a third painting of "The Shepherds and the Angels," which is intended to complete the series, and will be hung with the other two at St. Agatha's, when completed.

The Board of Trade have confirmed the order made by the Light Railway Commissioners for the Dover and River Light Railway, authorising the construction of a light railway in the borough and rural district of Dover and parish of River, in the county of Kent.

The large addition to the resident population of Osborne, consequent on the establishment of the Royal Naval College, which was opened by the King in August, has necessitated a complete overhauling of the drainage arrangements previously in use. A complete set of new drains has accordingly been laid down by Messrs. Doulton and Co., of Lambeth, S.E., while the disposal of the sewage has been entrusted to the Septic Tank Company, of Westminster, who have laid down an installation on their well-known system.

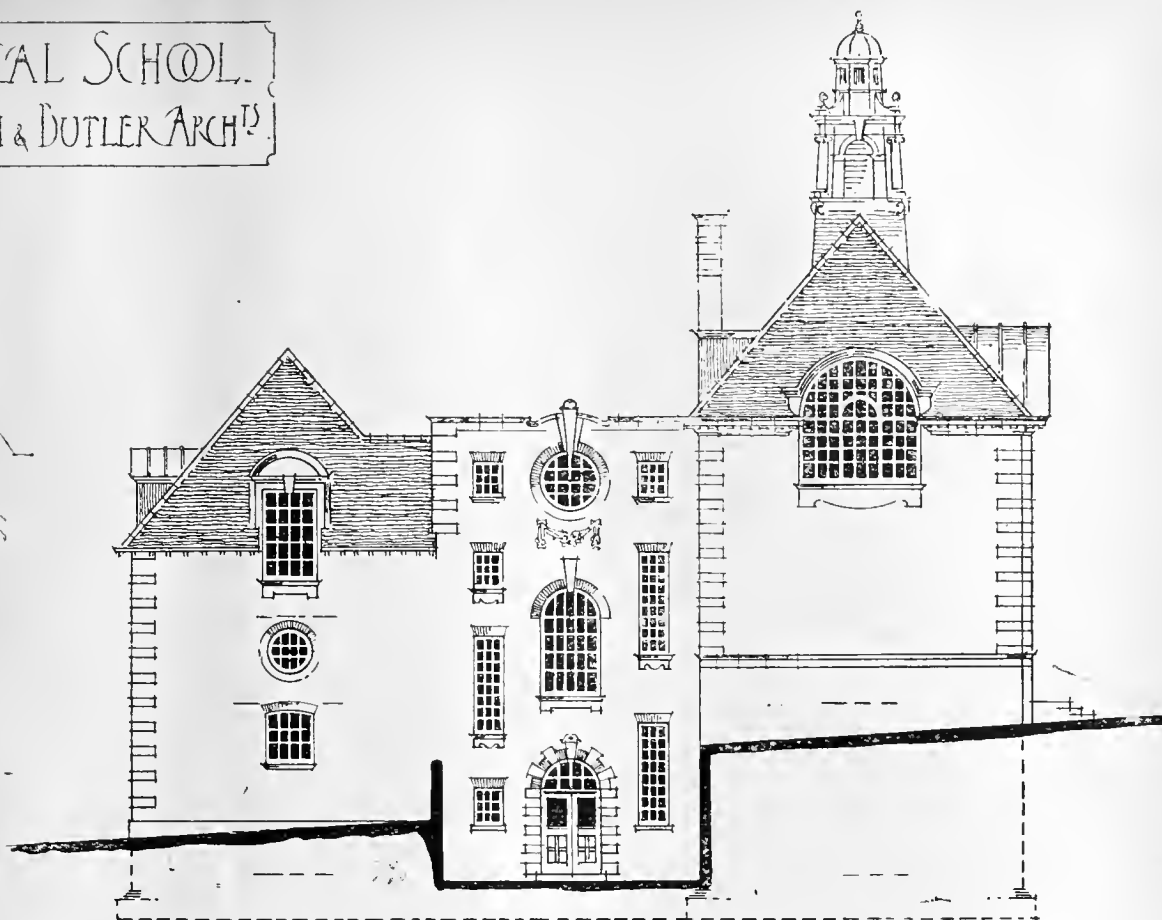
SUTTON COLDFIELD
SELECTED DESIGN



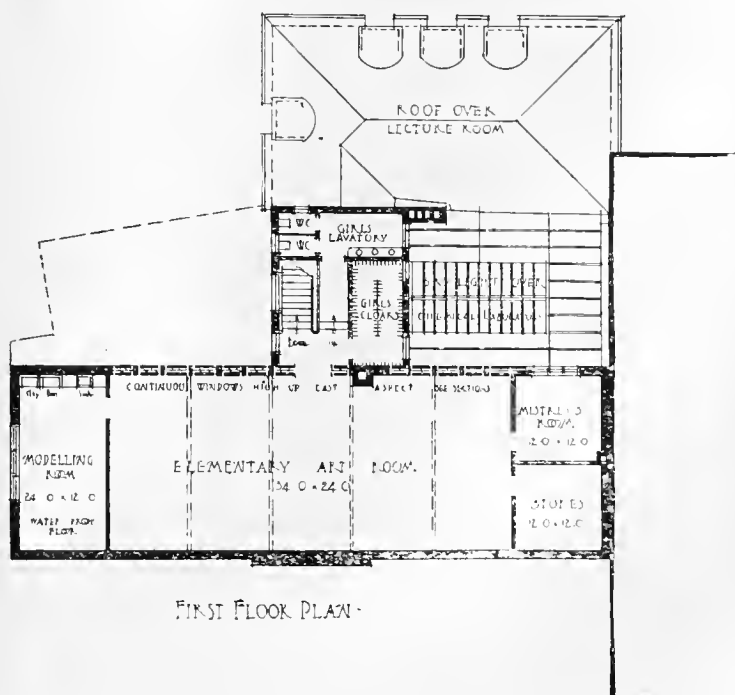
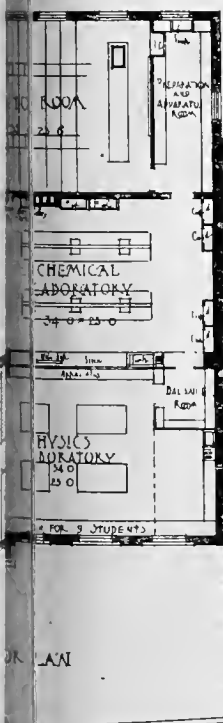
Oct. 23, 1903.

MECHANICAL SCHOOL.

BY CROUCH & BUTLER ARCHTS.



CAPEL



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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—R. H.—G. G.—Contractor.—T. L. (Preston). H. V. and Son.—Cement.—M. N. T. Bros. (Crewe).

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Sunny Jim," "Frena."

Intercommunication.

QUESTIONS.

[12015].—**Stove.**—What form of stove, without oil, coke, or coal, can you advise for warming a room about 12ft. square that has only an iron pipe chimney? There are gas-stoves innumerable, but I have not found one that is not objectionable. I believe I have seen recommended a small hot-water arrangement heated by gas.—GAS STOVE.

[12016].—**Draughts.**—I am about to prepare plans for a small and inexpensive house, and am anxious to avoid draughts in the sitting-rooms as much as possible. My own idea as to the cause of draughts, which are to be found in many rooms, even when the outer and inner doors are arranged to prevent direct currents, and when the windows are well fitted, is that they are caused principally by the current created in the flue by the fire, to supply which fresh air is sucked in at all crevices. I have two suggested remedies. The first: To supply air through chambers near the fire, in passing through which it is warmed, the supply thus obtained obviating the necessity to draw it from elsewhere. The second: To warm the entrances by radiators, so that air drawn in through the crevices of the door may be nearer the same

temperature as that in the room. I wish to obtain the desired result in the least expensive manner. I am quite aware that there must be a supply of fresh air, but think it should be possible to obtain it without unpleasant draughts. I shall be very glad to have other people's opinions as to whether my premises of the cause are correct; whether the proposed remedies are likely to be effective; and, if not, what better method to adopt?—VISEVEY.

[12017].—**Small Building.**—A carpenter friend of mine, a small builder, will take it down, but I wanted to get at the probable weight of it, and best method of bundling and packing. Will someone, therefore, tell me roughly? (1) What the weight is of corrugated iron per 100 or 1,000 super. feet; (2) the weight of lin. match-board; (3) of floor-joists generally used in a one-storied building, and of flooring; (4) and of the quartering, &c., used for uprights; (5) also, whether it would be profitable to transfer and re-erect the chimney brickwork in the country (North Hampshire), or buy new bricks down there; (6) the building measures 37ft. by 27ft., and perhaps you could give some idea of the cost of a chimney about 12ft. high, and of a concrete floor and of the foundations to stand the building on; (7) also the best way to deal with the widow-sashes and doors for the railway company to cart and carry.—G. FOSTER.

LEGAL INTELLIGENCE.

IN RE H. J. CAYE, MAIDA VALE.—At the London Bankruptcy-court, on Monday, a first meeting of creditors was held under the failure of Harry Jarvis Caye, builder, of Lauderdale Mansions, Lauderdale-road, Maida Vale. Mr. C. A. Pope, Assistant Official Receiver, presided. It appeared that the debtor began business ten years ago with a few pounds capital, and had since been engaged in building operations at Clapham, Willesden-lane, Haverstock Hill, and Maida Vale. He estimated his liabilities at £8,000, and attributed his insolvency to inability to let his buildings, interest on borrowed money, and failure to obtain permanent advances on mortgage. No proposal of composition was before the meeting, and Mr. Bournier, chartered accountant, was appointed trustee with a committee of inspection. The security to be provided by the trustee was provisionally fixed at £500.

THE LIVERPOOL TIMBER TRADE FAILURE.—In connection with the failure of Lightbound, Rigby, and Co., timber merchants, Liverpool, who also traded as the Saguaw Lumber Company, a meeting of creditors was held on Monday at the offices of the Official Receiver, who presided. The partners in the firm are Mr. Charles Latham and Mr. Ralph Norbury. The proofs of debt which had been sent in both upon the joint and separate estates having been read over, the Official Receiver said that he regretted that there was no statement of affairs to lay before the meeting. He understood that the books were not written up, and were not in a satisfactory state. When the statement of affairs was filed he, the Official Receiver, would have to investigate the matter, and make out his report and send it with the summary of the statement of affairs to all the debtors. The creditors decided to reserve any questioning of the debtors until they should appear for public examination on oath. A resolution for the appointment of Mr. W. C. Spencer, chartered accountant, of Liverpool, as trustee was passed unanimously, and a committee of inspection was appointed.

THE BRADFORD CORPORATION IMPROVEMENTS.—HAMYER AND OTHERS.—Lieut.-Colonel W. H. Wellsted, Mem.Inst.C.E., has issued his award in the above, amounting to £1,019. The claim was for the taking of 128 yards of land for the Church Bank improvement, and included the cost of altering the existing premises necessary through the alteration of the levels of the street adjoining. The valuation by the claimants' witnesses was £1,929, whilst that by the corporation witnesses was £457.

ARBITRATION CLAIM FROM SOMERSETSHIRE.—At the Surveyors' Institute, Westminster, before Sir Benjamin Baker, sole arbitrator, the case of Pearsons and the Great Western Railway Company has been in progress during this week. It is an arbitration as to the contract to decide the amount payable by the railway company to the contractors, Messrs. S. Pearson and Son (Ltd.), for the construction of the South Wales and Bristol Direct Railway from Wootton Bassett to Patchway. The total claim is about £1,600,000, but the amount in dispute is something approaching half a million. The company's contention broadly is, it is understood, that the contract was one for the execution of specified works for a lump sum, and though there might be certain extras during the progress of the contract to be added, yet substantially the amounts to which the claimants were entitled under the contract had already been paid to them. The proceedings are being held in private.

WATER COMPANIES' LIABILITY FOR REPAIRING STREETS.—The New River Company, of 173, Rosebery-avenue, were summoned at Clerkenwell Police-court, on Tuesday, for neglecting to pay the mayor, aldermen, and Councillors of Westminster the sum of £99 9s. 8d., due for expenses incurred in filling-in, making good, and maintaining the pavement in the streets within the City of Westminster where they had been broken open by the company. The

proceedings were taken under the Metropolitan Local Management Acts, 1855 and 1862. For the city council it explained that the dispute between the parties was as to the charges made by the borough council upon the water company with respect to the breaking-up of the streets. The council had revised these charges, and decided to add to them 10 per cent. for "supervision" in lieu of the water company making good any subsidence which took place within twelve months after the completion of the work, and which subsidence, it was added, always happened. The respondents objected that the Westminster Borough Council's charges were 25 to 30 per cent. in excess of the charges of other borough councils. It did not seem right that for the one piece of work they should have to pay higher in the Borough of Westminster than they did in the Borough of Kensington. The 10 per cent. was the last straw. The company had long objected to the charges of this council. Mr. John William Bradley, engineer to the City of Westminster, gave evidence in detail as to the charges of the corporation. He said the expenditure of the council in this department averaged £20,000 per year. They had to employ a staff to supervise the work, which was often done in "bits" at a distance from each other. The case was adjourned.

CHIPS.

Mr. Samuel Thomas Turtle, principal member of the firm of Messrs. Turtle and Appleton, builders and contractors, Wandsworth, died suddenly on Tuesday last at his residence on St. John's Hill, in his 52nd year.

Mr. Frederick L. Olmsted, jun., has been appointed as Professor of Landscape Design in Harvard University.

The London County Council have approved the estimate of £30,500 for the construction of an underground conduit system of electrical tramways along St. John-street and St. John-street-road, Clerkenwell.

The Rochford (Essex) Rural District Council have recognised the services of their surveyor, Mr. H. T. Sidwell, who has acted during the past three years as their engineer in works costing £25,000, by granting him a gratuity of £100.

The fund for the erection of new buildings at Bangor for the University College of North Wales on Saturday stood at £17,794, being augmented by several recent donations. The sum of £200,000 is required.

Earl Egerton, of Tatton, Lord Lieutenant of Cheshire, on Saturday unveiled a bronze statue of Queen Victoria, erected in the Square of Chester Castle as a city and county memorial of her late Majesty. The sculptor is Mr. F. W. Pomeroy, of London. The statue, an erect figure in robes of State, was cast by Messrs. Hollinshead and Burton, at Thames Ditton, and the pedestal, of Darley Dale stone, carved on the four sides with the Royal, county, and city arms, and the rose, shamrock, and thistle respectively, was executed by Messrs. W. Haswell and Son, of Chester.

An improvement was reported in business last week at the Tokenhouse-yard Mart. The public-hall buildings in Pier-avenue, Clacton-on-Sea, comprising a hall and seven freehold shops, producing £510 per annum, sold for £10,250. An island plot of land, measuring 2,546ft. in Southampton-row, was let upon a building lease for 80 years at £620 per annum.

A new church which has been erected in Glasgow-street, Ardrossan, for the E.U. congregation was opened on Friday. The building is capable of seating 500, and it is proposed to erect at a later date a gallery with seating accommodation for 170. The cost has been over £3,000.

Mr. G. F. Watts's equestrian statue, "Physical Energy," which is to be placed in the rocky crevice of the Matopos over the grave of Cecil Rhodes, has been successfully cast in bronze by Signor Parlati at Parson's Green, Fulham, and was on view on Saturday and Sunday. Of colossal size, it represents a nude young rider on a great horse reining in on the ridge of a hilltop. One of the youth's hands is raised to shade his eyes as he gazes into the distance. The horse has been pulled up suddenly, one foot is raised, its nostrils are dilated, and the hind limbs are strained as they grip the slope of the ground. The sculptor has done without the unhappy centre support which many sculptors have thought necessary to a horse in this position.

The London County Council Improvements Committee have settled at £183,150 the claim, amounting to £320,931, of the Metropolitan Electric Supply Company in respect of the cost of erecting and fitting up a new generating station, plant, &c., and of the expenses connected with the taking up, replacing, &c., of the company's mains. The Council is also required by Statute to provide a site, partly freehold and partly leasehold, for the reinstatement of the company's premises.

Our Office Table.

A WRITER in the *Hampshire Independent*, who writes from the Athenæum Club, gives some interesting details of the successive sales, always at enhanced prices, of the carved oak fittings formerly in Winchester College. He tells us that the woodwork when turned out of the chapel the time the so-called "restorations" were undertaken under Mr. Butterfield became the property of the contractor, who sold it for £50 to Old Wykehamist. The latter sold it for £500 Lord Heytesbury, who resold it last year for £700 to a dealer. The original drawings by the basons were then found in the British Museum, and the woodwork, after having been carefully stored, was sold, as recently stated, to Mr. Cooper for £30,000, after having been offered to the authorities at South Kensington, and refused by them. When to be had for the lowest price £5,000, says he tried hard to have it restored in Winchester College; but when he completely failed in this direction he endeavoured to divert his career for another good object, but with equal want of success.

PROFESSOR W. M. FLINDERS PETRIE delivered, on Friday afternoon, at the London University, Imperial Institute-road, the first of a series of lectures on "The Light Thrown on Early Civilisation by Recent Excavations in Egypt, Asia Minor, Babylonia, and Greece." Professor Flinders Petrie devoted his opening discourse to "The Rise of Civilisation in Prehistoric Egypt"; he spoke of that country as the primary source of our knowledge of civilisation in the East, and referred to the great advances made in that knowledge during the last fifty years. The first great step made had been to firmly link the old civilisation of Greece with that of Egypt. It was now possible to show the stages of the Eastern culture up to a period of something like 5,000 years B.C. We were now more familiar with the material civilisation of Egypt and its products in those times than we were with those of any European nation. The course of the rise of the Egyptian kingdom and that of its prehistoric age were far more clearly worked out; and for the first time we were able to trace every link in the chain from a period as far back as 9,000 or 10,000 years down to the present day. Palæolithic man, was, the lecturer said, certainly in Egypt before the Nile came to be in its present condition. Some of the earliest pottery of the Neolithic stage was almost identical with what might be found in Algiers.

AFTER much delay, due to references back on moot points, the City Court of Common Council have at length adopted a series of recommendations from the Streets Committee on the subject of certain by-laws in regard to the demolition of buildings in the City. The committee recommended that the by-laws, as amended, should be approved, and submitted to the Local Government Board for confirmation. It was stated that the regulations provided for the damping of all buildings before demolition, so as to prevent the evolution of clouds of dust, insisted on adequate boardings being erected for the protection of passers-by, and set forth that buildings within 20ft. of the roadway should only be demolished at night, or after three o'clock on Saturdays.

A FURTHER conference, convened by the Camberwell Borough Council, and presided over by the mayor (Mr. Goddard Clarke), has been held at the Camberwell Town-hall to consider the different treatment of the Metropolitan borough councils by the County Council in fixing the amounts of the local and county contributions towards the cost of street improvements carried out in London from March, 1889, to March, 1902. The following resolutions were adopted:—(a) That the present system, whereby the London County Council claims from the Metropolitan Borough Councils contributions on varying bases for similar improvements, is contrary to the practice which should prevail in the Metropolis. (b) That, having regard to the rapid growth of London and the consequent increase in traffic, and to the necessity for some uniform practice being adopted, this conference do now consider upon what principle it is prepared to recommend that the cost of London improvements should be borne. (c) That the principle of treating London as a whole, and of systematically selecting improvements best calculated to provide relief to the main thoroughfares, as advocated by a Select Committee of Parliament in 1871, should at once be formulated by the London County Council in a

definite and comprehensive scheme for all future county improvements, and upon which London should equally contribute upon rateable value.

(d) That in all thoroughfares in which tramways are or may be constructed, a width of not less than 54ft. should be provided, unless the road authority otherwise consent, and the total cost of widening borne by the London County Council, either out of the tramways account or the county rate. (e) That contributions to local authorities for local improvements should be, as far as possible, on a uniform basis.

FOR several years past residents of Yarmouth have carried on a silent crusade of grumbling against the system of watering the roads and streets with salt water. The ladies say that it spoils their dresses, cyclists that it rusts their machines, drivers and owners of vehicles complain about it, and many hold that it is wholly insanitary. That salt water lays the dust more readily than fresh water goes without saying, but it is now open to question whether, of the two evils, more dust is not better than much salt. A similar experience has resulted from the use of sea water at Hastings, where the borough engineer, Mr. P. H. Palmer, finds himself compelled, in an exhaustive report of his experience, to admit that the system has proved a complete failure.

MR. WINGFIELD DIGBY, M.P. has decided that the splendid remains of a Roman villa found on his property at Fifehead Neville, Dorset, shall be covered in, to secure their preservation and prevent injury. It has, however, been resolved that a permanent record shall be taken of the discovery, in the shape of plans and drawings; and this work has been undertaken by the Dorset Field Club, the president of which is Lord Eustace Cecil. When completed they will be placed in the Dorset County Museum at Dorchester. The Rev. C. Engleheart, who superintended the excavation, the whole cost of which was borne by Mr. Digby, regards the remains as among the most important of their kind yet found in England.

AN important concession has recently been made to schools by the Board of Agriculture. Most teachers realise how necessary Ordnance Survey maps are for sound class teaching in local geography, but the price has hitherto been prohibitive. In response to memorials from various sources, the Board of Agriculture has now issued instructions that special editions of the 1in. maps be supplied to educational authorities at the following prices:—200 copies, £1 5s.; 500 copies, £2; 1,000 copies, £3; 5,000 copies, £12. For larger numbers the estimated price would be £2 per 1,000 copies. The only stipulation made is that on no account are the maps to be sold.

THE most interesting object found in the tomb of the Pharaoh Thothmes IV. by Mr. Theodore Davies, who has been excavating in the Valley of the Tombs at Thebes, is the chariot of the dead monarch. The body of it alone is preserved, but in a perfect condition. The wooden frame was first covered with papier mâché made from papyrus, and this again with stucco, which had been carved both inside and out into scenes from the battles fought by the Pharaoh in Syria. The art is of a high order, every detail being exquisitely finished and the faces of Syrians being clearly portraits taken from captives at Thebes. The chariot is, in fact, one of the finest specimens of art that have come down to us from antiquity. Along with the chariot was found the leather gauntlet with which the king protected his hand and wrist when using the bow or reins.

ON Thursday evening in last week, under the auspices of the Carpenters' Company, Dr. A. Wynter Blyth, the medical officer of health for Marylebone, delivered a lecture on "Sanitary Building Construction" at Carpenters' Hall. Mr. Percy Preston, the Master of the Company, occupied the chair. Dr. Blyth briefly glanced at such subjects as the sanitary arrangement of buildings, the water supply, and drainage, devoting the main portion of his address to a consideration of the various methods of ventilation known to the builder, and used by him at the present day. He claimed for ventilation that it was a factor of the utmost importance in our everyday life, and largely affected the vital question of health. The presence of dust in a house, said the doctor, could not fail to be deleterious, for it had much to do with the presence of bacteria in the air. Thus, in a neglected building every cubic foot of atmosphere had been found to contain 2,600 specimens of bacteria, as against 500

in the well-ventilated house. The effect of this from the health and sanitation point of view, it was not difficult to imagine. Warmth, the lecturer pointed out, was one of the best and cheapest methods of ventilating residences. The opening of windows at night was another means of obtaining a pure air supply. The lecturer finally described several well-known patents for securing effective ventilation and pure air.

A LARGE and representative gathering of Flintshire gentlemen was convened at the Queen Hotel, Chester, on Friday, to confer with regard to the application to Parliament during the coming session for powers to construct an electric tramway connecting the districts of Bagillt, Greenfield, Holywell, Halkyn, Northop, Mold, Buckley, Sandicroft, Queensferry, Shotton, and Connah's Quay. The tramway will be worked on the overhead system, and the route, which extends about 30 miles, and serves a district with a population of 34,000, is circular. The cost of the scheme is estimated at £9,600 per mile. It is proposed to erect a generating station in the area, but not if electrical power can be obtained from a generating station which is to be erected by the North-Western Electricity and Power Gas Co., which was incorporated by Act of Parliament during last session.

ON Saturday, Mr. Charles Birchall, C.C., distributed prizes which he gives annually to his tenants in his Hexagon Cottages, Wheatland-lane, Seacombe, for the best results obtained in the cultivation of the gardens attached to and completely surrounding the houses, which are detached, and as the name implies, six-sided, with a central stack of chimneys running through the roof. Mr. Birchall explained that he had for years considered the question of the housing of the working classes. He was convinced that private enterprise would meet the difficulty, and could provide cheap and healthy dwellings with comfortable surroundings at a rent within the means of the working classes. Hence the Hexagon Cottages of Seacombe, which from a sanitary and social aspect could not, he held, be beaten. Such employers as Messrs. Lever Bros., W. P. Hartley, the Cheshire Lioes, the Cadburys, and their own district councils and county council, had shown by their action that slum life spread disaster at the very heart of the community. All the efforts, however, of public men were of little avail unless the working classes themselves co-operated, and, with this object in view, he intended to offer for the future a prize for the best kept and most tidy house, not necessarily the best furnished, but for cleanliness and comfort.

RECENT forest fires in the timber belt of Maine have devastated large tracts of land, hundreds of square miles, which cannot be replaced in many years, and the freshets in the Mississippi have carried away millions of feet of logs, which will never be recovered. A writer in the *Sun* says that more lumber has been destroyed this season by misadventure than manufacturers can cut in a year. These casualties and the natural consumption tend to make commercial timber scarce and high, and those who contemplate building where wood is required are advised to do so immediately, as it will be a long time before it can again be had at present rates. Southern lumbermen who furnish yellow pine are ninety days behind their orders, and the price has been advanced on some grades 2dol. per 1,000ft. The writer above quoted says that forestry is a very slow remedy for renewal of standing wood, for it takes thirty to forty years to grow trees to 24in. diameter, which is the size demanded for boards. The supply of hemlock in the immediate vicinity of this market has been exhausted, and people who require it are compelled to buy 300 miles away. There is practically no wood of this kind left in Pennsylvania, unless it may be in the western part of the State, and when this is cut and consumed it will be necessary to use other varieties. White pine, oak, and cypress have advanced during the year from 6dol. to 14dol. per 1,000ft. The increase in population annually reaches large figures, and the consumption of lumber must keep pace with it; but from the facts quoted there will be a shrinkage instead of a surplus over former years.

SOME suggestive facts on the competition between British and foreign contractors in Egypt are given in the last issue of the *Egyptian Gazette*, with reference to tenders for the extension of the roof of Cairo railway station. Copies of the specifications and plans were sent to 33 well-

known firms, of which there were British eight, Belgian eight, French six, American five, Italian three, German two. The constructors of the roof, Messrs. Dayd' Pillé et Cie., of Paris, were invited to tender, but sent in no offer. No offer came in from America. Only three British firms tendered, and of the remaining eleven offers six were from Belgium. The highest British offer was £16,144; lowest British offer, £12,567; average British offer £14,042. Average time specified for the work, without counting the erection, eight months. Highest Belgian offer, £9,842; lowest Belgian offer £7,715; average Belgian offer, £8,376. Average time specified for the whole work, six months. "Can it be wondered at," asks the *Gazette*, "that the Administration, which, as we know, is not overburdened with wealth, took the lower Belgian offer—viz., that of Messrs. Beaume and Marpon? What can be the explanation of the enormous difference of £4,852 between the lowest British and the lowest Belgian offers? The British work may be a little better, but the Belgian firm is well known, and the difference in the quality of the work can hardly be commensurate with the difference between the offers."

The building trade in Sydney, New South Wales, is just now distinguished by a spirit of more than ordinary activity. In the city, shops and warehouses are being altered and extended. Manufacturers—preparing to profit by the imposition of the new Federal tariff, which will procure a wide home market for local manufactures—have already spent £1,500,000 on the erection of new premises. When the Iron Bonus Bill has been passed by the Commonwealth Parliament, it is expected that another £1,000,000 will go towards the erection and installation of steel mills in the vicinity of Sydney, and on the shores of its harbour.

A REPORT on forests and forest economy in Germany has been made by Dr. Frederick Rose, the British Consul in Stuttgart. Dr. Rose explains the organisation and course of instruction at Eberswalde (in Prussia), Aschaffenburg (in Bavaria), and Karlsruhe (in Baden), as well as the subsequent prospects of the qualified students in the different states, in order to show what forestry as a profession is in Germany. Out of the total of 135 million acres forming the German Empire, about 35 millions consist of forests or forest lands. Rather more than half of this consists of purely forest holdings, the remainder being attached to agricultural holdings. Baden has the largest relative area of forests, the proportion of the whole area of the state being 40 per cent., while in Prussia it is 25, in Bavaria 33, and in Wurtemberg 30 per cent. The oak is chiefly grown on the Lower Rhine and in Westphalia, the beech in Pomerania, the fir in South Germany, the pine on the Central German hills, the Scotch pine on the plains of North-Eastern Germany, while the low-lying lands everywhere grow the elm, ash, beech, oak, and birch. The Scotch pine is the most widely cultivated of any tree, the pine and fir and the beech coming next in extent of area covered. The annual revenue derived from forests in Germany is estimated at 15 to 18 millions sterling. The state of Wurtemberg possesses 1½ millions of acres of forests, the produce of which in 1900 yielded £1,700,000; the cost of production was £500,000, leaving a profit of £1,200,000, or about 16s. an acre. If the taxation be deducted from this, there is a clear profit of 14s. an acre. A steady annual increase has taken place in the value per acre of forest produce since 1860, which amounts in the cases of Prussia, Saxony, and Wurtemberg to as much as 80 per cent.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—Architectural Association. Conversazione at Royal Institute of Water Colour Painters, Piccadilly. 5 p.m.

Princess Christian visited Ashbourne on Thursday in last week and opened a new cottage hospital, erected at a cost of nearly £3,000 as a memorial to Queen Victoria.

The General Purposes Committee of the Folkestone Corporation have decided to apply to the Board of Trade for the variation of its tramways order, so as to include powers for the construction of tramways on the overhead system. At the present time the corporation is bound to a conduit or surface contact system, but before it can adopt the overhead principle the sanction of Earl Radnor, which hitherto has been refused, will have to be obtained.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN SEPTEMBER.—The monthly memorandum prepared by the Labour Department of the Board of Trade is based on 3,506 returns—viz., 2,187 from employers or their associations, 1,254 from trade unions, and 65 from other sources. It states that employment in September continued to decline. As compared with a year ago there is a considerable falling-off in the general state of employment, and the percentage of unemployed members of trade unions is higher than the mean percentage for September in the past ten years. In the 226 trade unions, with an aggregate membership of 553,508, making returns, 32,179 (or 5.8 per cent.) were reported as unemployed at the end of September, as compared with 5.5 per cent. in August, and 5.0 per cent. in the 221 trade unions, with a membership of 553,870, from which returns were received for September, 1902. The mean percentage of unemployed returned at the end of September during the past decade was 4.5. In the building trade, employment continues moderate, but shows a decline as compared with a year ago. The percentage of unemployed trade union members among carpenters and joiners was 4.0 at the end of September, compared with 2.9 at the end of August, and a 3.3 a year ago. The percentage for plumbers was 6.4 at the end of September, compared with 7.1 at the end of August, and 5.9 a year ago. As to the furnishing and woodworking trades, employment shows a slight decline as compared with August, and is worse than a year ago. The percentage of unemployed trade union members at the end of September was 4.7, as against 4.2 in August, and 3.9 in September, 1902. In the pottery trades employment has improved. In the brick and tile trades it is fair.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0	to £5 15 0
Rolled-Steel Joists, English.....	6 10 0	" 6 12 6
Wrought-Iron Girder Plates.....	7 0 0	" 7 5 0
Bar Iron, good Staffs.....	8 5 0	" 8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0	" 20 0 0
Do., Welsh.....	5 15 0	" 5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0	" 8 15 0
Best Saeedhill.....	9 10 0	" 9 10 0
Angles 10s., Tees 20s. per ton extra.		
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.		
Builders' Hoop Iron, galvanised, £12 to £13 per ton.		
Galvanised Corrugated Sheet Iron—		
No. 18 to 20. No. 22 to 24.		
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£11 15 0	to £12 0 0
Best ditto.....	12 5 0	" 12 10 0
Cast-Iron Columns.....	£6 10 0	to £8 10 0
Cast-Iron Stanchions.....	6 10 0	" 8 10 0
Rolled-Iron Fencing Wire.....	8 0 0	" 8 5 0
Rolled-Steel Fencing Wire.....	6 5 0	" 6 10 0
Galvanised.....	7 15 0	" 8 0 0
Cast-Iron Sash Weights.....	4 12 6	" 4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0	" 9 5 0
Cut Floor Brads.....	9 0 0	" 9 0 0

Wire Nails (Points de Paris) —	6 to 7	8	9	10	11	12	13	14	15	B.W.G.
	8/-	8 6	9/-	9 6	9 9	10 6	11 3	12/-	13/-	per cwt.
Cast-Iron Socket Pipes—										
4in. to 6in.....	£5 15 0	to	£6 0 0							
6in. to 8in.....	5 12 6	"	5 17 6							
10in. to 24in. (all sizes).....	5 7 6	"	5 10 0							

[Coated with composition, 5s. 6d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lillieshall.....	105s. 0d. to 112s. 6d.
Hot Blast, ditto.....	65s. 0d. to 70s. 0d.
Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—	
Gas-Tubes.....	67 p.o.
Water-Tubes.....	62 1/2 "
Steam-Tubes.....	57 1/2 "
Galvanised Gas-Tubes.....	55 "
Galvanised Water-Tubes.....	50 "
Galvanised Steam-Tubes.....	45 "

	10cwt. casks.	5cwt. casks.
Per ton.	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0	to £24 10 0
Do., Vieille Montagne.....	26 5 0	" 26 15 0
Sheet Lead, 3lb. and upwards.....	13 12 6	" 13 12 6
Lead Water Pipe (F.O.R. Lond.).....	14 2 6	" 14 2 6
Lead Barrel Pipe.....	15 2 6	" 15 2 6
Lead Pipe, Tinned inside.....	16 3 6	" 16 2 6
Do., and outside.....	17 12 6	" 17 12 6
Composition Gas-Pipe.....	16 2 6	" 16 2 6
Soil-Pipe (3in. and 6in. extra).....	16 2 6	" 16 2 6
Pig Lead, in lwt. pigs.....	10 16 3	" 10 17 6
Lead Shot, in 28lb. bags.....	15 0 0	" 15 5 0
Copper Sheets, sheathing and rods.....	68 0 0	" 68 5 0
Copper, British Cake and Ingot.....	57 15 0	" 58 5 0
Tin, Straits.....	115 0 0	" 116 0 0
Do., English Ingots.....	118 0 0	" 118 5 0
Spelter, Silesian.....	20 12 6	" 20 15 0

TIMBER.

Teak, Burmah.....	per load	£10 0 0	to	£18 0 0
" Bangkok.....	"	9 15 0	"	16 0 0
Quebec Pine, yellow.....	"	3 12 6	"	6 5 0
" Oak.....	"	4 12 6	"	7 10 0
" Birch.....	"	5 0 0	"	10 0 0
" Elm.....	"	4 7 6	"	9 0 0
" Ash.....	"	4 12 6	"	8 5 0
Dantsic and Memel Oak.....	"	2 12 6	"	6 10 0
Fir.....	"	3 2 6	"	5 10 0
Wainscot, Riga p. log.....	"	2 7 6	"	5 5 0
Lath, Dantsic, p.f.....	"	4 0 0	"	6 0 0
St. Petersburg.....	"	4 0 0	"	8 0 0
Greenheart.....	"	7 15 0	"	8 0 0
Box.....	"	7 0 0	"	15 0 0
Sequoia, U.S.A.....	per cube foot	0 3 6	"	0 3 6
Mahogany, Cuba, per super foot				
lin. thick.....		0 0 6	"	0 0 6
" Honduras.....	"	0 0 6	"	0 0 7 1/2
" Mexican.....	"	0 0 4	"	0 0 0
" African.....	"	0 0 3 1/2	"	0 0 0 1/2
Cedar, Cuba.....	"	0 0 3	"	0 0 3 1/2
" Honduras.....	"	0 0 3 1/2	"	0 0 0 1/2
Satinwood.....	"	0 0 10	"	0 1 0
Walnut, Italian.....	"	0 0 3	"	0 0 7 1/2
" American (logs).....	"	0 8 1	"	0 3 1
Deals, per St. Petersburg Standard, 120—12ft. by 1 1/2 in.				
by 1 1/2 in. :—				
Quebec, Pine, 1st.....	£22 0 0	to	£29 5 0	
" 2nd.....	18 5 0	"	23 10 0	
" 3rd.....	11 15 0	"	14 0 0	
Canada Spruce, 1st.....	11 10 0	"	15 0 0	
" 2nd and 3rd.....	8 10 0	"	9 15 0	
New Brunswick.....	8 0 0	"	9 10 0	
Riga.....	7 10 0	"	8 5 0	
St. Petersburg.....	8 10 0	"	16 10 0	
Swedish.....	11 10 0	"	19 10 0	
Finland.....	9 0 0	"	10 5 0	
White Sea.....	12 0 0	"	19 10 0	
Battens, all sorts.....	6 10 0	"	14 0 0	
Flooring Boards, per square of lin. :—				
1st prepared.....	£0 13 6	"	£0 19 0	
2nd ditto.....	0 12 0	"	0 16 0	
Other qualities.....	0 6 0	"	0 14 0	
Staves, per standard M :—				
U.S. pipe.....	£37 10 0	"	£45 0 0	
Memel, cr. pipe.....	220 0 0	"	230 0 0	
Memel, brack.....	190 0 0	"	200 0 0	

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 6
Red Mansfield ditto.....	"	0 2 6
Hard York ditto.....	"	0 2 10
Ditto ditto 6in. sawn both sides, landings, random sizes.....	per foot sup.	0 2 10
Ditto ditto 3in. slabs sawn two sides, random sizes.....	"	£0 1 10
* All F.O.R. London.		
Bath Stone, delivered on rail at quarry stations.....	per foot cube	£0 1 6
Delivered on road waggons, Paddington Depot.....	"	0 1 6
Ditto ditto Nine Elms Depot.....	"	0 1 8
Portland Stone, in random blocks of 20ft. average :—		
Brown.....	per foot cube	£0 1 5 1/2
White.....	"	£0 1 7 1/2
Delivered to railway depot at the quarry.....	per foot cube	£0 1 5 1/2
Delivered on road waggons, at Paddington Depot.....	"	0 2 1
Ditto Nine Elms Depot.....	"	0 2 2 1/2
Ditto Pimlico Wharf.....	"	0 2 2 1/2

OILS.

Linseed.....	per tun	£18 5 0	to	£18 12 0
Rapeseed, English pale.....	"	23 5 0	"	23 10 0
Do., brown.....	"	22 0 0	"	22 10 0
Cottonseed, refined.....	"	22 0 0	"	24 0 0
Olive, Spanish.....	"	32 0 0	"	32 0 0
Seal, pale.....	"	26 0 0	"	31 0 0
Cocoonut, Cochins.....	"	30 0 0	"	36 0 0
Do., Ceylon.....	"	25 0 0	"	25 10 0
Palm, Lagos.....	"	28 0 0	"	19 5 0
Oleine.....	"	17 5 0	"	17 5 0
Lubricating U.S.....	per gal.	0 7 0	"	0 8 0
Petroleum, refined.....	"	0 5 1/2	"	0 5 1/2
Tar, Stockholm.....	per barrel	1 6 0	"	1 6 0
Do., Archangel.....	"	19 6 0	"	1 0 0
Turpentine, American.....	per tun	37 0 0	"	37 5 0

The memorial-stone in connection with St. Luke's new Sunday schools at Barrow was laid on Saturday. The schools consist of numerous classrooms with central hall to accommodate 1,000 children.

A new building on the Broadway, Peterborough erected by the city council, at a cost of about £4,000, from the plans of their surveyor, Mr. J. W. Walshaw, carried out by Mr. J. Lucas, and which the county council have now taken over and rechristened the "Peterborough County Technical School," was opened on Monday evening.

The London County Council have voted £7,000 for the erection of a sub-fire-station in the High street of Eltham.

Dr. William Henry Corfield, Hon. A.R.I.B.A. of Savile-row, sanitary adviser to the Office of Works since 1893, vice-president of the Sanitary Institute, and medical officer of health for St. George's, Hanover-square, who died on August 2, last, at Marstrand, Sweden, aged 59 years, has left estate of the gross value of £12,868 8s. 11d., including £5,135 14s. 3d. in net personality.

LIST OF COMPETITIONS OPEN.

Harrogate—Pump-Room and Colonnade in Valley Gardens	£10 10s.	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate.....	Oct. 23
Green—Public Library (limit £2,000)	£13 15s., £10 10s., £5 5s.	Samuel Jones, Clerk, Old-road, Skewen, Neath	Nov. 9
Kilmarnock—Tenement of Shops and Workmen's Houses	£100, £50, £25	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock ..	" 9
Sunderland—Additions to Town Hall	£30, £15, £10, and three of £5 5s.	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	" 21
Weymouth—Pavilion and Winter Gardens	50gs. (merged), 25gs.	Frank Bethell, Hon. Sec., Town Hall, Bray	" 30
Wakefield—Reconstructing Cattle Market	100,000, 75,000, and 50,000 kronen	R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Wormhill, S.E.—Public Library		H. J. Smith, Clerk, Lumbeth Town Hall, Kennington Green, S.E. ..	" 15
Wynne—Machinery to Lift Boats		The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	(1904) Mar. 31
Wynne—Branch Library for Parkhead District		Sir J. D. Marwick, Town Clerk, City Chambers, Glasgow	—
Wynne—Cotton Exchange (Local Architects)		Peter Brown, Sec., 50, Brown's Buildings, Liverpool	—
Wynne—Board School		J. Rennie, Clerk, School Board Offices, Oldham	—
Wynne—Workmen's Hall (1,500 seats)		The Secretary, Workmen's Institute, Llwynypia, Wales	—

LIST OF TENDERS OPEN.

BUILDINGS.

Easton-super-Mare—Cabmen's Shelter	Urban District Council	Hugh Nettleton, Surveyor, Town Hall, Weston-super-Mare	Oct. 21
Exhall—Coronation Clock Tower, West Parade	Corporation	Robert Hembrow, Architect, 171, Queen's-road, Hastings	" 21
Exham—Labourers' Cottage	Rural District Council	M. F. Conlin, Clerk, Court House, Sligo	" 21
Exham—Concrete Foundations for Purifiers	Gas Committee	R. H. Townsley, General Manager, Gas Offices, East-parade, Leeds ..	" 21
Exham—Engine Shed	Waterworks Co.	J. P. Larkman, Secretary, Beccles	" 21
Exham—Police-Station	Glamorgan County Council	T. Mansel Franklyn, Clerk, Westgate-street, Cardiff	" 21
Exham—Alterations to First Presbyterian Church	Corporation	W. D. R. Taggart, Architect, 11, Bridge-street, Belfast	" 21
Exham-on-Avon—Washhouses, Mason's-court	Urban District Council	R. Dixon, Boro' Sur., Municipal Offices, Sheep-st., Stratford-on-A.	" 21
Exham—Depot, &c., Ley-street	School Board	H. Shaw, A.M.I.C.E., Surveyor, Town Hall, Biford	" 21
Exham—Schools (1,200 places), Llanishen-street	T. Wilkinson	Veall and Sant, Architects, Arcade Chambers, Cardiff	" 21
Exham—Nine Houses	Guardians	A. B. Linford, Architect, Carlton Villa, Wombwell	" 21
Exham—Hospital Pavilion at Workhouse, Horton-lane	Corporation	F. Holland, Archt., 11, Parkinson's Chmbs., Hustlergate, Bradford	" 21
Exham—Converting Ten Houses into Five Houses	London County Council	Mrs. C. Thomas, Glynant Villa, Town Hill-road, Saffery	" 21
Exham-on-Avon—Bathroom and Lavatory, Seven Stars Inn	Standing Joint Committee	R. Dixon, Boro' Sur., Municipal Offices, Sheep-st., Stratford-on-A.	" 21
Exham Elms, N.W.—Lennox Buildings	Tramways Committee	The Architect's Dept., 19, Charing Cross-road, W.C.	" 21
Exham—Additions to Police Station	London County Council	The County Surveyor's Office, Shire Hall, Dorchester	" 21
Exham—Re-erecting Shop	Guardians	Arthur W. Bradley, Borough Engineer, Bank-street, Bury	" 21
Exham—N.E.—Villette Buildings	Urban District Council	The Architect's Dept., 19, Charing Cross-road, W.C.	" 21
Exham—Additions to Working-Men's Institute	Westminster City Council	The Secretary, Institute, Pontypridd	" 21
Exham—Escape Stair at Schools	Urban District Council	A. J. Murtagh, Architect, 23, Strutt-street, Manchester	" 21
Exham—Timber Sheds	Westminster City Council	C. H. Petty, Architect, Waterhouse-street, Halifax	" 21
Exham—Meter and Governor House	Urban District Council	W. W. Hutchinson, Engineer, 10, Pontefract-road, Barnsley	" 21
Exham—Six Shops and Flats, High-street	Urban District Council	W. A. Davies, A.M.I.C.E., Town Hall Chambers, Hounslow	" 21
Exham—Reconstructing Slipper Baths, Marshall-st.	Urban District Council	The Town Clerk, Westminster City Hall, Charing Cross-road, W.C.	" 21
Exham—Fire Brigade Station	Urban District Council	The Surveyor's Office, Town Buildings, Sowerby Bridge	" 21
Exham—Addition to Oakwood Bakery, Roundhay	School Board	James Charles and Sons, 93, Albion-street, Leeds	" 21
Exham—Boundary Walls at Penydarren Schools	Wm. Conway and Sons, Ltd.	J. Llewellyn Smith, Architect, Aberdare	" 21
Exham—Warehouse and Shops, Bull Green	Urban District Council	Richard Horsfall and Son, Architects, 221, Commercial-st., Halifax	" 21
Exham—Altering and Refitting Trefgarne Owen Chapel	E. H. Rudd	D. Edward Thomas, Architect, Haverfordwest	" 21
Exham—Chimney Shaft at Destructor and Electricity Works	H.M. Commissioners of Works	Price F. White, Electricity Works, Bangor, North Wales	" 21
Exham—Five Cottages	E. H. Rudd	A. T. Martindale, Architect, 68, Wellington-road, Bridlington	" 21
Exham—Detached Cottage	Corporation	Chas. W. Breadmore, 120, High-street, Winchester	" 21
Exham—Superstructure of Postal Stores	Library Committee	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Exham—Rebuilding Castle Inn	Corporation	C. M. Davies, 12, High-street, Merthyr	" 21
Exham—Alterations to Cottages	Corporation	A. T. Martindale, Architect, 68, Wellington-road, Bridlington	" 21
Exham—Beverley-road Baths	Corporation	E. White, M.I.C.E., City Engineer, Town Hall, Hull	" 21
Exham—Converting Houses into Bank and Business Premises	Corporation	P. Vivian Jones, Architect, Henstead	" 21
Exham—Central Library, Deanery-road	Corporation	H. Percy Adams, F.R.I.B.A., 23, Woburn-place, Russell-sq., W.C.	" 21
Exham—Methodist Church and Manse	Corporation	The Rev. H. Kevin, Colonel	" 21
Exham—St. John's Presbyterian Church, Victoria-road	Corporation	Thos. W. Cubbon, Architect, 54, Hamilton-street, Birkenhead	" 21
Exham—Altering Board Room at Workhouse	Corporation	A. Druiett, Clerk, Christchurch, Hants	" 21
Exham—Columb Minor—Wesleyan Church	Corporation	Sampson Hill, Architect, Green-lane, Redruth	" 21
Exham—Demolishing Wards at Hospital	Corporation	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 21
Exham—Ward Block at Workhouse Infirmary	Corporation	A. Saxon Snell, F.R.I.B.A., 22, Southampton Bldgs, Chancery-l., W.C.	" 21
Exham—Twenty-six Cottages, Burnt Oak-terrace	Corporation	Ernest J. Hammond, M.S.A., 21, Bulmoral-road, Gillingham	" 21
Exham—School	Corporation	C. R. Dalglish, Architect, Shrewsbury	" 21
Exham—Cells at Court House	Corporation	H. Hugh Archdall, Secretary, Court House, Enniskillen	" 21
Exham—Laundry and Mortuary	Corporation	The Clerk of Asylums Committee, 6, Waterloo-place, S.W.	" 21
Exham—Extensions of Workhouse Hospital	Corporation	Thomas Wain and Sons, Architects, 92, Albion-street, Leeds	" 21
Exham—Hospital	Corporation	Young and Hall, Archts., 17, Southampton-st., Bloomsbury, W.C.	" 21
Exham—Government Offices	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Exham—Laundry, Chimney Shaft, &c., at Workhouse	Corporation	H. J. Guinane, Union Clerk, Limerick	" 21
Exham—Additions to Ordnance Survey Offices	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Exham—Branch Library	Corporation	J. R. Vining, 89, Chancery-lane, W.C.	" 21
Exham—Telephone Exchange, Quay-street	Corporation	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 21
Exham—School (1,000 places), Manor-road	Corporation	Edmund Kirby, F.R.I.B.A., 5, Cook-street, Liverpool	" 21
Exham—Additions to Premises, West-street	Corporation	W. R. Story, Architect, 2, St. Nicholas Bldg., Newcastle-on-Tyne ..	" 21
Exham—Workshop	Corporation	Percy Fox, Architect, 14, Manchester-road, Bradford	" 21
Exham—Additions to Claremont Hotel	Corporation	Butler Wilson and Oglesby, Architects, 12, East Parade, Leeds	" 21
Exham—Post-Office	Corporation	F. J. Rayner, Architect, Fort-road, Newhaven, Sussex	" 21
Exham—Rebuilding Premises	Corporation	Captain Griffith Davies, 7, Castle-street, Cardigan	" 21
Exham—Fifty Workmen's Cottages	Corporation	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	" 21
Exham—Additions to New Inn	Corporation	H. E. and A. Bown, Architects, James-street, Harrogate	" 21
Exham—House, &c., Canal-road	Corporation	Aird and Calder, Navigation Offices, Dock-street, Leeds	" 21
Exham—Mortuary Building	Corporation	Harrison and Ward, 66, Victoria-street, Westminster, S.W.	" 21
Exham—Altering Primitive Methodist Chapel	Corporation	F. J. Rayner, Architect, Fort-road, Newhaven, Sussex	" 21
Exham—Two Semi-Detached Houses	Corporation	Wm. Drithfield, Architect, Boroughbridge-road, Knaresborough	" 21
Exham—Restoration of Chapels	Corporation	Harrison and Ward, 66, Victoria-street, Westminster, S.W.	" 21
Exham—Country Residence, Cottage, and Stabling	Corporation	J. A. Souttar, Architect, 41, Bishopsgate-street Within, E.C.	" 21
Exham—Two Pairs of Semi-Detached Villas	Corporation	William H. Sharp, Architect, 239, Rooley-lane, Bradford	" 21

ELECTRICAL PLANT.

Devonport—Motor-Driven Booster	Corporation	The Boro' Electrical Engineer, Newport-st., E. Stonehouse, Devon	Oct. 24
Exham—Switchboard, &c.	Urban District Council	W. L. Rothwell, Engineer, Council Offices, Radcliffe	" 26
Exham—Plant	Corporation	H. Waring, Electrical Engineer's Office, Todmorden	" 31
Exham—Ducts, &c.	Corporation	C. A. L. Prusmann, Borough Electrical Engineer, Strand, Swansea	" 31
Exham—Wiring Abbey Mills Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Nov. 3
Exham—Laying Telephone Pipes	Paving Committee	The City Surveyor's Office, Town Hall, Manchester	" 5
Exham—Electric Wiring Houses	Urban District Council	John A. Angell, Surveyor, Council Offices, Bekeham	" 9
Exham—Plant	Corporation	Kennedy and Jenkin, Engineers, 17, Victoria-street, Westminster ..	" 18
Exham—Electric Lighting Public Buildings	Corporation	F. J. Warden-Stevens, A.M.I.M.E., 34, Victoria-st., Westminster ..	" 20
Exham—Electric Power and Light Installation at Workhouse	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	—

ENGINEERING.

Exham—Hydraulic Lifts	Gas Committee	R. H. Townsley, Gen. Manager, Gas Offices, East-parade, Leeds ..	Oct. 24
Exham—Sinking Borehole	Corporation	E. A. B. Woodward, Waterworks Eng., Town Hall, Wolverhampton	" 26
Exham—Heating Police Department at Town Hall	Hertford County Council	H. G. Whyatt, A.M.I.C.E., Boro' Eng., Town Hall-square, Grimsby	" 26
Exham—Reconstructing Bridge	Urban District Council	Urban A. Smith, County Surveyor, Hatfield	" 26
Exham—Borehole	Drainage Committee	J. T. Eys, M.I.C.E., 39, Corporation-street, Birmingham	" 27
Exham—Detritus and Septic Tanks	Holderness Gas Co., Ltd.	The City Engineer's Office, Guildhall-street, Canterbury	" 27
Exham—Trenches (6,000 yds.)	Urban District Council	J. Holliday, Civil Engineer, St. Mark's-street, Hull	" 27
Exham—Station Master	Lancashire and Yorkshire Ry. Co.	W. W. Hutchinson, Engineer, 10, Pontefract-road, Barnsley	" 27
Exham—Bridges, &c.		The Engineer's Office, Hunt's Bank, Manchester	" 27

ENGINEERING—continued.

Goring—Water-Supply Extensions	Thames Valley and Goring Water Co.	George H. Robus, Engineer, Mansion House Chambers, E.C.	Oct. 2
Rosely to Whatstandwell—Section of Derwent Aqueduct	Derwent Valley Water Board	Edward Sandeman, Engineer's Office, Bamford, near Sheffield	" 23
Galway—Waterworks	Urban District Council	Jaa. Perry, M.E., M.I.C.E., County Surveyor's Office, Galway	" 23
Ipswich—Piling at Alexandra Park	Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	" 23
Newcastle to Annborough—Railway Extension (4 miles)	Belfast and County Down Ry. Co.	G. P. Culverwell, Eng.-in-Chief, Queen's Quay Terminals, Belfast	" 23
Valetta—Malta—Lift Construction	Corporation	The Receiver-General and Director of Contracts, Malta, Valetta	" 31
Hull—Three Cornish Boilers at Beverley-road Baths	Corporation	E. White, M.I.C.E., City Engineer, Town Hall, Hull	" 31
Sowerby Bridge—Purification Works	District Council	Spinks and Pilling, Engineers, 20, Park-row, Leeds	" 31
Treazon—Service Reservoir	Harbour Trustees	J. Davies and Son, A.M.I.C.E., Llanelly	" 31
Wick—Wharf	Corporation	James Barron, M.I.C.E., Aberdeen	" 31
Swansea—Tramways, &c.	Urban District Council	George Bell, Borough Surveyor, 13, Somerset-place, Swansea	" 31
Kingsbridge—Waterworks	Ministry of Public Works	T. W. Latham, Engineer, Kingsbridge	Nov. 2
La Puebla de Cara Mizel, Corunna—Wharf Works	Norfolk & Suffolk Jnt. Ry. Committee	The Ministry of Agriculture and Public Works, Madrid	" 2
Cromer to Mundesley—Railway (9½ miles)	Health Committee	William Marriott, Engineer, Melton Constable, Norfolk	" 2
Birmingham—Destructor	Spennymoor and Tudhoe Gas Co.	The Superintendent, Montague Wharf, Birmingham	" 2
Spennymoor—Gasholder Tank	Town Council	Wm. Cowley, Secretary, Gasworks, Spennymoor	" 2
Portsmouth—Pumping-Station	Newton Abbot Rural Dist. Council	The Borough Engineer's Office, Town Hall, Portsmouth	" 2
Bovey Tracey—Reservoir	London County Council	Wm. Fox and B. A. Tatton, M.I.C.E., 5, Victoria-street, S.W.	" 2
West Ham—Engine, Dynamo, &c., Abbey Mills Pumping Sta.	Joint Railways Co.	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 2
Stranraer—Pier Widening	Rural District Council	J. Thomson, Secretary, Citadel Station, Carlisle	" 4
St. Austell—Waterworks	Chelmsford Rural District Council	T. H. Andrew, Engineer, 1, Trevarrick Villas, St. Austell	" 4
Ingatstone—Well at New Waterworks (350ft. deep)	Corporation	J. Dewhurst, A.M.I.M.E., Aveoue Chambers, Chelmsford	" 5
Bridlington—Parade Extension Works	Board of Guardians	Ernest R. Matthews, Borough Engineer, Town Hall, Bridlington	" 7
Leeds—Heating Workhouse Hospital Extension	Board of Guardians	Thos. Winn and Sons, Architects, 92, Albion-street, Leeds	" 9
Limerick—Laundry Machinery Appliances at Workhouse	West London Schoola Managers	H. J. Guinane, Union Clerk, Limerick	" 10
Limerick—Heating Workhouse by Steam	Bulth Rural District Council	H. J. Guinane, Union Clerk, Limerick	" 10
Ashford, Middlesex—Well (300ft. deep)	Docks Committee	G. Midgley Taylor, 27, Great George-street, Westminster, S.W.	" 12
Llanwrtyd Wells—Storage Reservoir (262,500 gallons)	Corporation	R. L. Bamford, Surveyor, Wildemars-street, Hereford	" 16
Bristol—Double-Decked Opening Bridge over River Avon		W. W. Squire, Engineer, Cumberlind-road, Bristol	" 16
Kilmarnock—Three Lancashire Boilers		Kennedy and Jenkin, Engineers, 17, Victoria-street, Westminster	" 18
New York, U.S.A.—Tunnels from Sixth Avenue to East River and Long Island City	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	Dec. 15
New York, U.S.A.—Tunnels under Thirty-second-street, Manhattan, and North (Hudson) River	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
New Jersey, U.S.A.—Tunnels under Bergen Hill and North (Hudson) River	P., N.J., and N.Y. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
London, S.E.—Tunnel Between Rotherhithe and Ratchiff	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Jan. 19
Cairo—Three Road Bridges over the Nile	Ministry of Public Works	The Com. Int. Branch, Board of Trade, 50, Parliament-street, S.W.	Feb. 1
Ipswich—Extension of Water-Main at Borough Asylum	Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	" 1

FENCING AND WALLS.

Leeds—Boundary Wall	Gas Committee	R. H. Townsley, Gen. Man., Gas Offices, East-parade, Leeds	Oct. 24
Waterloo—Wrought-Iron Railing at Victoria Park	Urban District Council	F. Spencer Yates, A.M.I.C.E., Surveyor, Town Hall, Waterloo	" 24
Gravesend—Unclimbable Corrugated Sheet Iron Fencing	Town Council	C. E. Hatten, Town Clerk, Town Hall, Gravesend	" 24
Portland—Stone Wall and Cast-Iron Railings, Easton-square	Urban District Council	R. Stephenson Henshaw, Eng., Council Offices, New-rd., Portland	" 29
Merthyr Tydfil—Boundary Walls, Penydarren Schools	School Board	J. Llewellyn Smith, Architect, Aberdare	" 29
Tooling, S.W.—Boundary Wall at Grove Hospital	Metropolitan Asylums Board	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	Nov. 4
Morpeth—Concrete Retaining Wall	Rural District Council	J. Murray McGregor, Highway Surveyor, Market-place, Morpeth	" 4

FURNITURE AND FITTINGS.

Birkenhead—Poor Law Offices, Argyle-street	Guardians	John Carter, Clerk, 45, Hamilton-square, Birkenhead	Oct. 24
Newport, Isle of Wight—Public Library	Watch Committee	W. V. Gough, Architect, 24, Bridge-street, Bristol	" 24
Accrington—School Chairs (400)	Standing Joint Committee	D. Longton, Wesley School, Abbey-street, Accrington	" 27
Hull—Central Police-Station		J. H. Hirst, City Architect, Town Hall, Hull	" 27
Cardiff—Furniture and Bedding		The Chief Constable's Office, Canton, Cardiff	" 30
Brawdy—Refitting Interior of Trefgarne Owen Chapel		D. Edward Thomas, Architect, Haverfordwest	" 30
Leavesden—Double-Hung Sashes to Asylum Windows	Metropolitan Asylums Board	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	Nov. 4

PAINTING.

Darfield—Nine Houses	T. Wilkinson	A. B. Linford, Architect, Carlton Villa, Wombwell	Oct. 26
Bradford—Hospital Pavilion at Workhouse	Guardians	F. Holland, Architect, Hustlergate, Bradford	" 26
Leeds—Holbeck Cemetery	Committee	The City Engineer's Office, Municipal Buildings, Leeds	" 27
Manchester—Assize Courts		J. D. Harker, A.R.I.B.A., 78, King-street, Manchester	" 27
Roundhay, Leeds—Oakwood Bakery		James Charles and Sons, 98, Albion-street, Leeds	" 29

PLUMBING AND GLAZING.

Bradford—Workhouse Hospital Pavilion	Guardians	F. Holland, Architect, Hustlergate, Bradford	Oct. 26
Sowerby Bridge—Fire Brigade Station	Urban District Council	The Surveyor's Office, Town Buildings, Sowerby Bridge	" 28
Warrington—Seven Shower-Baths, Legh-street	Baths Committee	Thos. Longdin, Borough Engineer, Town Hall, Warrington	" 29
Leeds—Workhouse Hospital Extension		Thos. Winn and Sons, Architects, 92, Albion-street, Leeds	Nov. 9

ROADS AND STREETS.

Wallsend—Streets	Corporation	George Hollings, Borough Surveyor's Office, High-street, Wallsend	Oct. 21
Hornsey, N.—Road Works	Urban District Council	E. J. Lovegrove, Engineer, 99, Southwood-lane, Highgate, N.	" 23
Weymouth—Making-up Roads	Melcombe Regis Burial Board	Samuel Jackson, Surveyor, Bridge Chambers, Weymouth	" 26
Manchester—Street Works	Paving Committee	The Surveyor's Office, Town Hall, Manchester	" 26
Sowerby Bridge, Yorks—Levelling, &c.	Urban District Council	The Surveyor's Office, Town's Buildings, Sowerby Bridge	" 27
Salford—Street Works	Corporation	The Borough Engineer's Office, Town Hall, Salford	" 27
Enfield—Making-up River-front	Urban District Council	Richard Collins, Surveyor, Public Offices, Enfield	" 29
Enfield—Making-up Fyfield-road	Urban District Council	Richard Collins, Surveyor, Public Offices, Enfield	" 29
Stockport—Street Works	Highway and Sewers Committee	John Atkinson, A.M.I.C.E., Borough Surveyor, Stockport	" 29
Enfield—Making-up St. Andrew's-road	Urban District Council	Richard Collins, Surveyor, Public Offices, Enfield	" 29
Leeds—Paving and Flagging Streets	City Council	The City Engineer's Office, Municipal Buildings, Leeds	" 31
Romford—Indurated Stone Paving	Urban District Council	J. Turvey, Surveyor, Romford	Nov. 2
Prestwich—Street Improvement Works	Urban District Council	The Surveyor's Office, Chester Bank, Prestwich	" 2
Romford—Laying Granite Setts	Urban District Council	J. Turvey, Surveyor, Romford	" 2
Hastings—Granite Kerb (3,000ft.)	Corporation	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings	" 2
Romford—Limestone Tar Paving	Urban District Council	J. Turvey, Surveyor, Romford	" 2
Tottenham—Making-up Roads	Urban District Council	W. H. Prescott, A.M.I.C.E., 712, High-road, Tottenham	" 3
Godstone—Making-up Salisbury-road	Rural District Council	J. George-Powell, C.E., Godstone	" 4
South Shields—Paving and Making-up New Roads	Rural District Council	J. H. Morton, F.R.I.B.A., 50, King-street, South Shields	" 4
Godstone—Making-up Barfields-road	Rural District Council	J. George-Powell, C.E., Godstone	" 4

SANITARY.

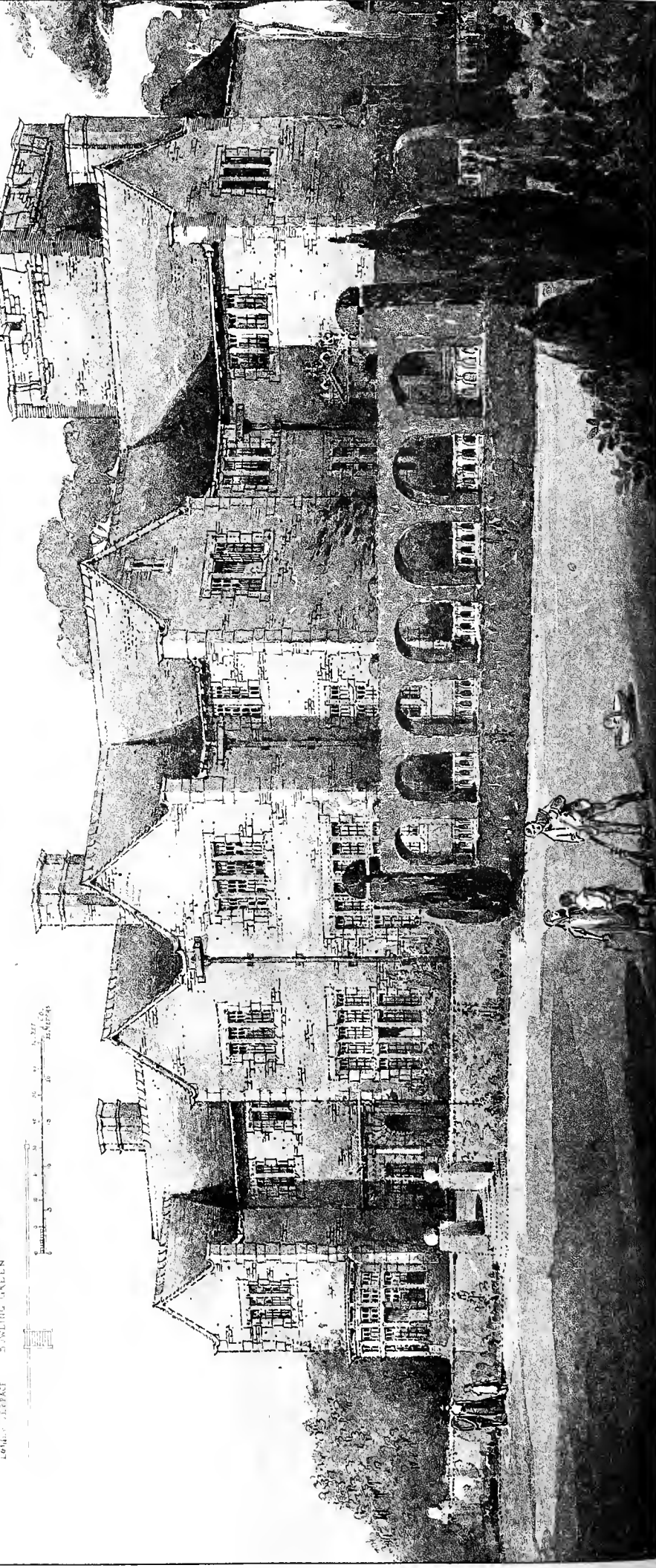
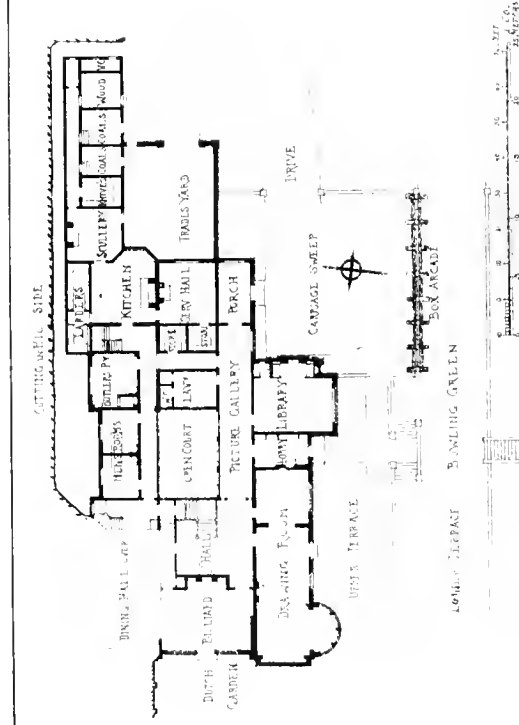
Fulford—Sewers		Farrow and Everist, Surveyors, 8, New-street, York	Oct. 21
Manchester—Sewering, &c., Ashfield-grove	Paving Committee	The Surveyor's Office, Town Hall, Manchester	" 26
Hornsey, N.—Sewer	Urban District Council	E. J. Lovegrove, Engineer, 99, Southwood-lane, Highgate, N.	" 26
Manchester—Sewering, &c., Brookfield-road	Paving Committee	The Surveyor's Office, Town Hall, Manchester	" 26
Woodford, Essex—Sewerage and Sewage-Disposal Works	Urban District Council	William Farrington, A.M.I.C.E., Surveyor, Woodford Green	" 26
Manchester—Sewering, &c., Middlewood-street	Paving Committee	The Surveyor's Office, Town Hall, Manchester	" 26
Mountain Ash—Sewers	Urban District Council	The Surveyor, Town Hall, Mountain Ash	" 27
Canterbury—Cast-Iron Trunk Sewer (1,860yds. of 33in.)	Drainage Committee	The City Engineer's Office, Guildhall-street, Canterbury	" 27
Salford—Reconstructing Sewer, Regent-road	Town Council	L. C. Evans, Town Clerk, Town Hall, Salford	" 28
Poole—Sewers	Rural District Council	John Elford, Borough Surveyor, Poole	" 28
Rotherham—Sewerage Works	Works Committee	F. Platts, Engineer, High-street, Rotherham	" 29
Basingstoke—Sewers	Corporation	F. R. Phipps, A.M.I.C.E., Boro' Sur., Town Hall, Basingstoke	" 29
Ipswich—Public Convenience at Alexandra Park	Urban District Council	E. Buckham, Borough Surveyor, Town Hall, Ipswich	Nov. 3
Tottenham—Underground Convenience, Park-lane	Town Council	W. H. Prescott, A.M.I.C.E., 712, High-road, Tottenham	" 3
Portsmouth—High-Level Relief Sewer	Urban District Council	The Borough Engineer's Office, Town Hall, Portsmouth	" 3
Tottenham—Underground Convenience, Seven Sisters-road	Urban District Council	W. H. Prescott, A.M.I.C.E., 712, High-road, Tottenham	" 3
Tottenham—Underground Convenience, Duckett's-green	Urban District Council	W. H. Prescott, A.M.I.C.E., 712, High-road, Tottenham	" 4
Watford—Sewerage Works	Urban District Council	H. Morten Turner, Clerk, Council Offices, Watford	" 24
Belper—Sewage Outfall Works	Corporation	C. J. Lomax, A.M.I.C.E., Alliance Bldgs., 37, Cross-st., Manchester	" 24
Barrow-in-Furness—Conveniences, Abbey-road	Corporation	The Borough Engineer, Town Hall, Barrow	" 24
Ulverston—Sanitary Work, Steel-street	Corporation	J. W. Grundy and Son, Brodgen-street, Ulverston	" 24
Barrow-in-Furness—Urinal Extension on Walney Promenade	Corporation	The Borough Engineer, Town Hall, Barrow	" 24

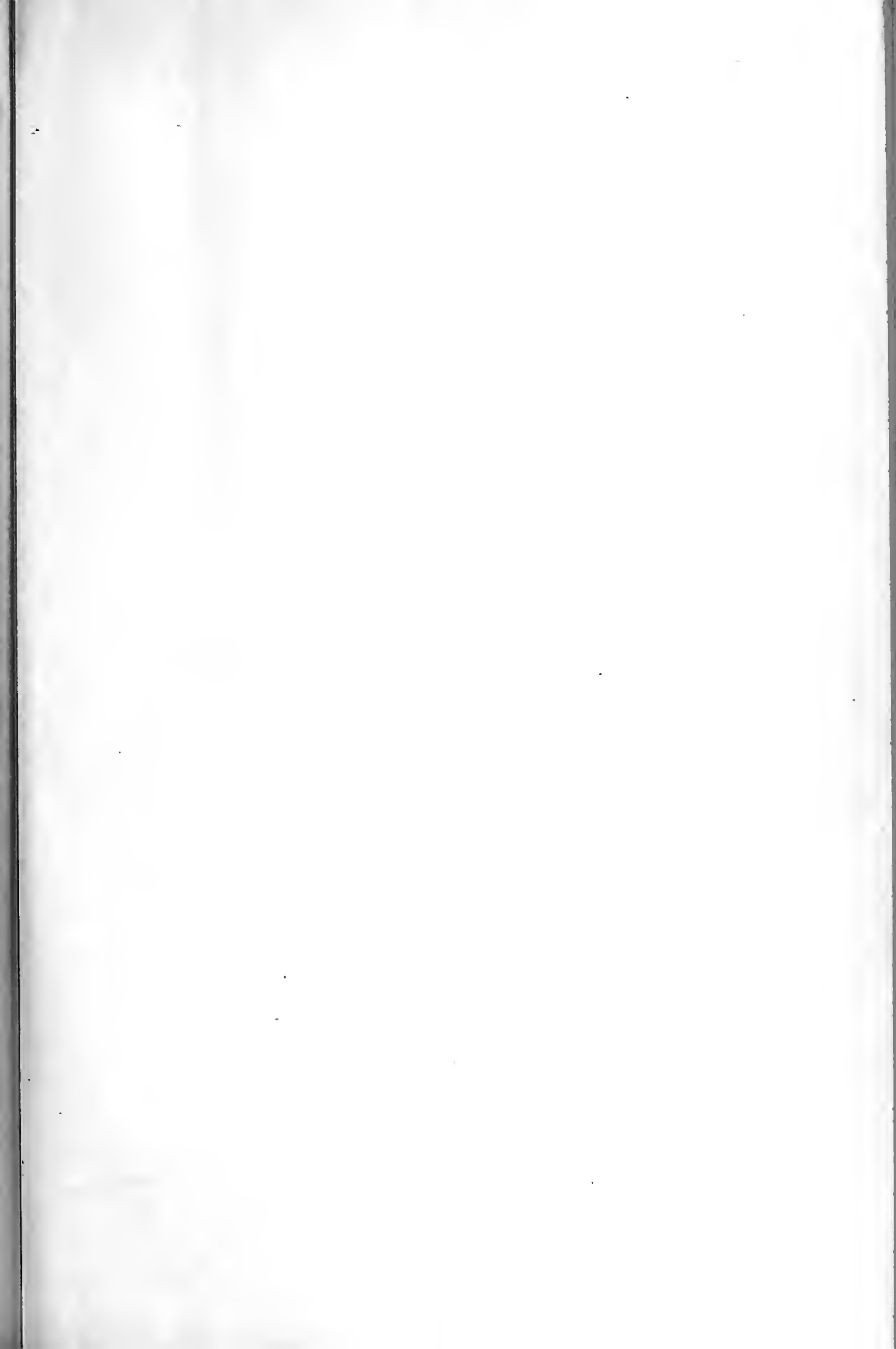
STEEL AND IRON.

Torquay—Ventilating Shafts	Town Council	H. A. Garrett, A.M.I.C.E., Town Hall Chambers, Torquay	Oct. 26
London, E.C.—Boiler-Plates, &c.	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, E.C.	" 29
Sowerby Bridge—Steelwork to Fire Station	Urban District Council	The Surveyor's Office, Town Buildings, Sowerby Bridge	" 29
Galway—Cast-Iron Pipes (54 tons)	Urban District Council	Jas. Perry, M.E., M.I.C.E., County Surveyor's Office, Galway	" 29
Swansea—Tramway Rails and Fishplates	Corporation	C. A. L. Prusmann, Borough Electrical Engineer, Strand, Swansea	" 31

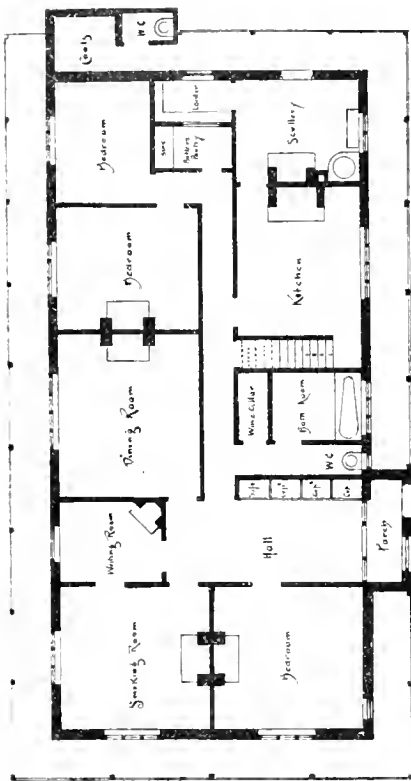


THE BUILDING NEWS, OCTOBER 23, 1903.





Bungalow at Wambrook, Somerset
for W. Saller Bevis Esq J.P.
By Mr. W. J. Adams, Architect.



Ground Plan



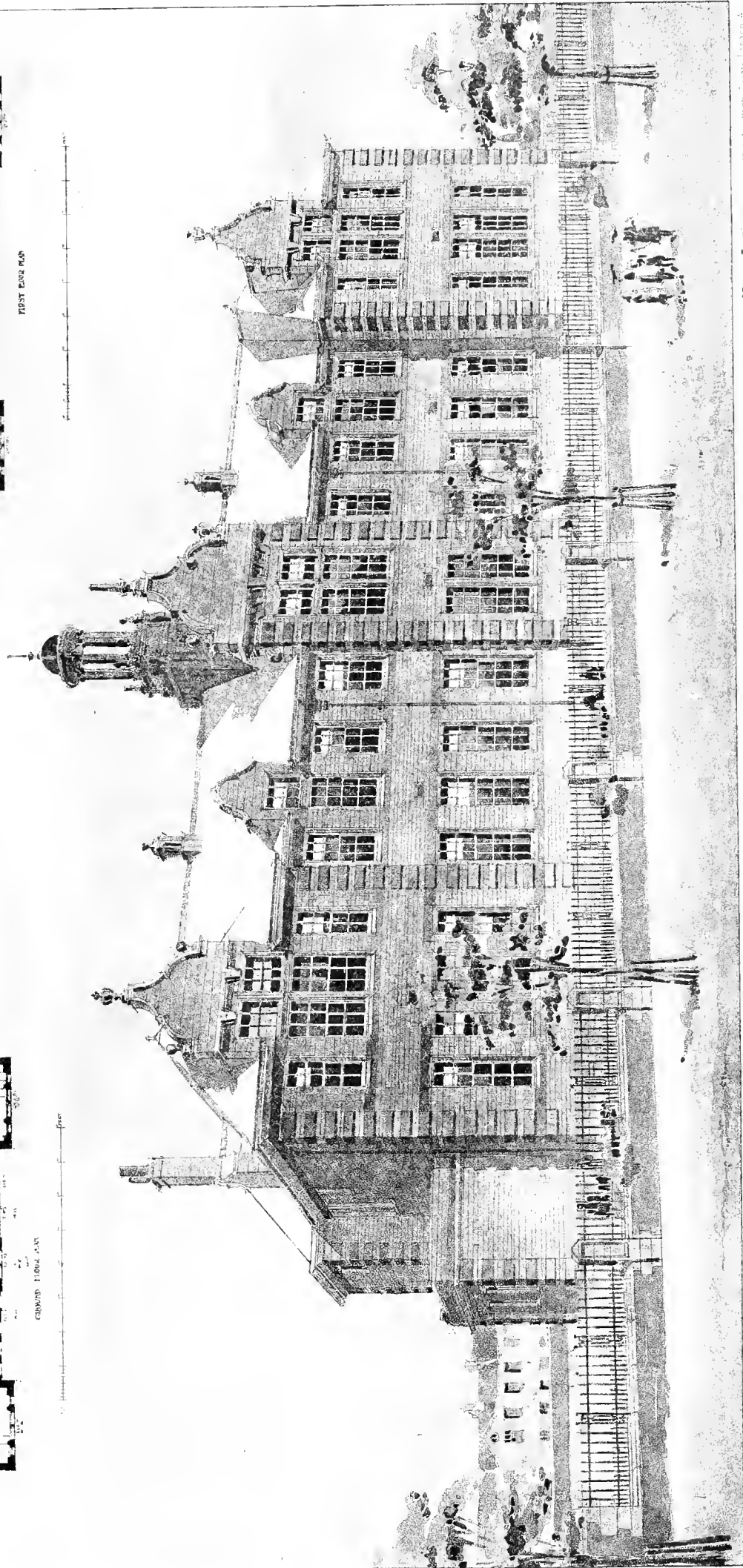
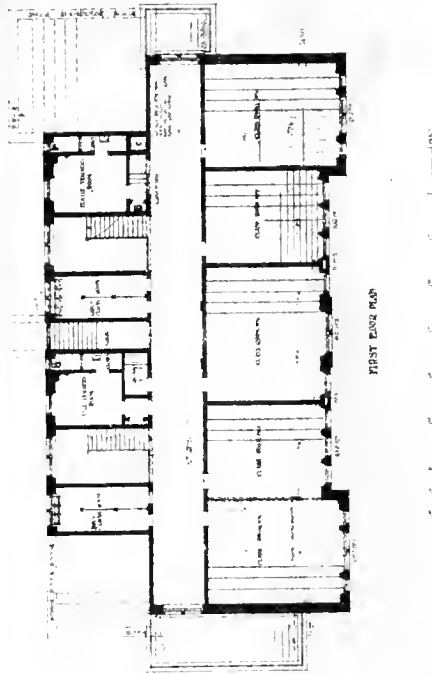
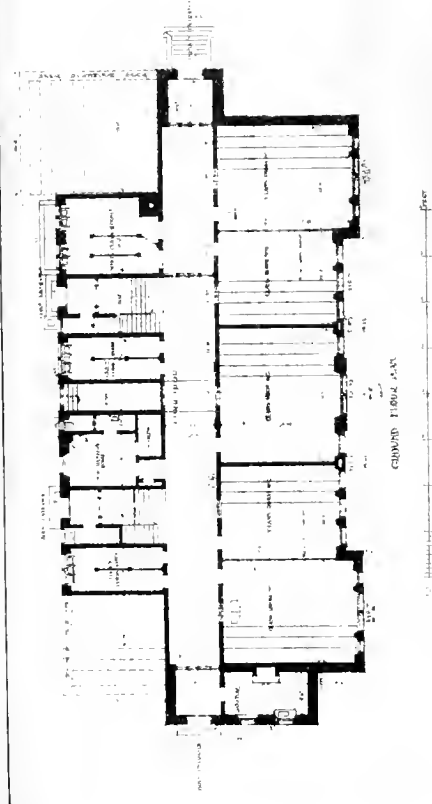


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KING'S PARK SCHOOL, DALKEITH. THOMAS T. PATERSON, ARCHITECT.

THE BUILDING NEWS

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FRIDAY, OCTOBER 30, 1903.

INTRACTABLE BUILDINGS.

MANY of our recent building problems do not readily lend themselves to architectural treatment; they seem to absolutely defy those principles of design and composition which have been associated with "old world" edifices. One of the earliest instances of this lack of agreement with the older type of building was the erection of structures in which iron is used, for, as every architect knows, this new material completely revolutionised the forms and proportions of buildings of brick and stone. To a large extent we have outlived this apparent discordance; iron and steel are now used in almost every large street and commercial building, and the profession have become familiar with the engineering requirements and the conditions of those materials. But we are not quite so accustomed to other conditions which modern necessities have imposed on our buildings of a certain class—such, for instance, as the large commercial block, the huge block of flats for dwellings or offices, theatres, baths, and wash-houses, and others. These have to be designed to meet the requirements of municipal and local authorities. They must be fire-resisting in their construction, with ample means of access and egress; they must be designed, as in the case of a theatre, on approved lines for sight and sound; be planned and constructed to accommodate a large number of occupants or workers, and be equipped with the latest fittings and mechanical appliances, all of which things mean a departure from old models. Even the street terrace or row of houses cannot be designed on the same lines as those of sixty years ago; they must be built higher, have better accommodation in many ways, and be fitted with the latest appliances in the form of lifts, fire-resisting floors and partitions, and must be built to conform to building by-laws and regulations. The constructional details and methods of decoration have introduced many things that cannot be made to harmonise with the older methods. The London town house of the eighteenth century may be taken as a means of comparison. We find them designed to give all the accommodation on the ground and first floors, the upper floors being reserved for bedrooms and nurseries, and servants' rooms. On these upper rooms the architect bestowed very little thought or attention, as the average old town house shows the upper stories shorn of all architectural details or ornament, with small stair accommodation and without the necessary adjuncts of lavatories or bathrooms. All the skill and taste of the architect were bestowed on the lower reception-rooms of the ground and first floor. These were often well planned for effect, with a spacious hall and staircase. The rooms were large, and were adorned with dadoes, handsome cornices and chimney-pieces, and the joinery, though usually plain, was of the best kind. The ceilings were often panelled or decorated in plaster, and there was a sense of taste and comfort which was denied to the rooms on the upper stories, which were often low, badly arranged, lighted, and ventilated. Many of these older houses, which are still tenanted, have been entirely remodelled or rearranged to meet present-day requirements. The Great Fire does not seem to have prevented the construction of wooden partitions, or the provision of easy means of egress; but the outer walls, and sometimes the main cross walls, were solidly built of brick, which

is more than we can say of middle-class dwelling-houses at the present day under Act of Parliament regulations. Our modern middle-class terrace house of to-day is very different. The reception-rooms on the ground and first floors are less handsome in their construction and fittings, the walls are thinner; but the windows are large, the rooms rather more lofty. The upper stories are, as a rule, better planned, more convenient; there is a bathroom and lavatory accommodation, and the rooms are well lighted and ventilated. These are decided gains, but at the expense of a certain sense of proportion and comfort which we often find in the houses of the last century. The 18th-century house, with all its disadvantages, from a material point of view, could be built to harmonise with architectural rules and proportions. There were no building by-laws or sanitary regulations which forbade the use of massive window-frames brought out nearly to the face of wall, of bold breaks and porches, and deep cornices, often very effective, of timber work in gables. Take again a block of artisans' dwellings or flats. The cost of ground rent requires them to be built of many stories with windows of the same size in every story, and the architect finds it exceedingly difficult to impart any variety or to introduce architectural features. We have only to look at the dismal, monotonous blocks in the Blackfriars-road or Clerkenwell to see what is meant. In the last century houses for the labouring class were not built. Those erected as almshouses were often one or two stories at the most, and built in quadrangles or in groups. The rows of residential flats and houses we see in the western suburbs of London have more or less the monotonous repetition of features, even though partially disguised by a flimsy kind of architectural detail in terracotta. There is the recrudescence of ornamental gables, of corner turrets and bay windows, which tire one by their restlessness, so very different to the fine old terrace houses in Bloomsbury, Grosvenor and Cavendish-squares, the Adelphi, and elsewhere. These were characterised by dignity of style or a chastened simplicity of façade reminding us of the work of Kent or the Brothers Adams. There was something architectural also about the Regent's Park and Belgrave-square type of terrace houses designed chiefly by Nash, Basevi, and Cubitt. The "Cubitt-built" squares and terraces are at least substantial and dignified; but we cannot so call many of those which have been built within the last decade or so at South Kensington, where the modern spirit of restless detail predominates. The commercial warehouse or business house is a comparatively modern structure which cannot be made to conform to architectural treatment. The large areas of floors, the few division walls internally, the large and numerous window openings, their necessary repetition, render it almost impossible to adopt any of the rules of architecture. The attempt to apply architectural rules and proportions or details to those buildings is to make them amenable to criticism of often a not very complimentary kind. Such treatment is generally out of keeping or very ridiculous. The height and proportions of the stories have to be adapted to strictly utilitarian requirements, and to structural methods which defy artistic proprieties, and the architect who values honesty of expression in his work must boldly renounce traditional forms and seek to adopt a new method. In these instances the very attempt to be architectural defeats its own end. There are no precedents; the problem is a new one, to be solved independently of them. Our ancestors would have found out the way to design a large city warehouse if the same problem had been presented to them. The big town hotel is another case. The old inns and hostels were small and limited in comparison, though they

served their purpose well in their day, and were very interesting structures. Modern town life and facilities of travel have rendered the large hotel a necessity of our day. There are no old models to fall back upon, so the architect has to do the best he can on a given site. The problem of providing accommodation for a crowd of single individuals and families, spacious rooms for daily wants, and bedrooms and suites for sleeping, &c., in addition to private suites of rooms, has made it necessary to build palatial buildings comprising many stories. The old parlour and coffee-room of the country inn has developed into the spacious and luxuriously fitted-up *salle-à-manger*, and a variety of other rooms for writing, reading, smoking, billiards, &c., are provided, where all the social festivities of the best society can be carried on with the least friction, combining, as far as possible, the comforts of a private residence with the advantages of a club. To those requirements the architect has to add those of a *cuisine* of exceptional excellence, in which all the latest cooking and culinary appliances are provided. There must also be provided easy transit from floor to floor by means of lifts; an equable warm temperature must be suffused over the interior by means of a heating system, and the ventilation and sanitary arrangements must be above suspicion. These varied and conflicting requirements, so unlike the simple wants of the old-fashioned hotel, have materially increased the thought required to give architectural expression. The great number of stories and rooms has increased the difficulty of fenestration. For instance, the numerous windows, all of about the same size, cannot be arranged satisfactorily, and render any architectural treatment out of the question. A bold order of columns or pilasters appears out of place in a façade crowded with windows, and therefore the astylar treatment is more in keeping with buildings of this kind. Internally, the complexity of the arrangement also renders a reposeful design impossible; everything is cut up by the various trades concerned, and the designs for vestibule or hall decoration, for woodwork, metal-work, electric light fittings are intrusted to different firms. The more complex and intricate the building, the less readily does it adapt itself to architectural treatment. The requirements of fire-resisting construction are also prejudicial to architectural design, as they impose conditions as to floors and roofs, lifts and staircases, which cannot be made architectural in the ordinary sense. The inclosed staircase and lift preclude the possibilities of internal features like open arcing and panelled sides. The modern theatre may be mentioned. The separation of the auditorium from the stage by a fire-wall carried high above the roof is not an arrangement that can be made externally pleasing as we see it in many recent structures;—both have to be treated as distinct structures. Again, the requirements of an auditorium free from columns below the dress-circle, which has to overhang the area considerably, cannot be made to agree with architectural canons. The steel cantilevers to the galleries and the dead blank of ceiling below are distinctly inimical to effect internally, however ingenious the devices adopted. That these constructive expedients may be improved from an architect's point of view we do not deny; but they only show what a difficult problem the modern auditorium has become. Externally the provision of iron fire-escape staircases for exit purposes and for fire-brigade attack, which is strongly advocated, and is made compulsory at Buda Pesth and other foreign cities, adds a feature that must be brought into harmony with the elevations of these structures. As they are now applied externally, it cannot be said they improve the architecture. Public baths and

washhouses and technical institutes are so essentially utilitarian that they can scarcely be considered to come within the range of architecture of the conventional sort; but it is needless to multiply examples of modern buildings which seem to defy considerations of art in their design.

To attempt to find out the reason of the discordance between modern buildings and those which conform to architectural laws would be an inquiry of interest. The old building conformed to architectural standards which have been in existence from time immemorial. It was easy and natural to apply the style of the age to the structure. The style became a sympathetic expression, but the modern types which we have mentioned, based on very different conditions, do not respond to the same treatment. There is little that is responsive between a modern warehouse or a block of dwellings in flats and the Classic or Gothic style; the latter modes became the natural treatment of buildings designed for different purposes, and with quite other materials. It is the architect's business to find out the fundamental cause of the difference, to begin at the rudiments of his new structure—to begin at the beginning instead of trying to hark back to former methods—to invent a method of treatment that will suit his purpose, quite independent of what has been done before for quite different purposes. At all costs, he must avoid the temptation to adopt old forms and conventions because they are convenient modes of expression; and it is always safer for him to begin again to seek out afresh what is in accordance with common-sense construction and honestly expresses it, however simple it may appear, than to try to make his building look like something he has seen before. He must first fully comprehend the problem in its several bearings, what its functions are to be, and the most direct way of carrying them out, the materials at his disposal and their proper treatment, the most reasonable and simple construction, and upon these rudimental bases he must proceed to build. The plainest structure founded upon these principles will be more satisfactory than one where the traditional forms have been adopted. But the advice may be said to be more easily given than followed. How is the architect to fully understand the problem? This is the first step. Unless he has a perfect knowledge of the trade or use of a given building, how can he comprehend it? Or if he has not a practical knowledge of a material like iron or steel, how can he design in it? These are reasonable questions which are not readily answered. He needs a preparation or novitiate; he must be able to put himself into the position of the client or tradesman who intends to build before he can comprehend the functions of the building; so it is necessary for him to put himself in the place of the engineer to realise the practical nature of the iron and steel and their proper treatment and details. As Mr. Arthur T. Bolton, the master of the A.A. Day School, pointed out the other day, "Education is not the acquisition of certain definite information, but the training of the mind to meet contingencies that can never be accurately seen." The very word "education," indeed, as he observes, means the leading out or development of the mind—the discipline and training of, not the exercise of the retentive powers of the mind, and this distinction especially deserves insistence just now in these days of professional examinations. The mental power to think and act should be the chief aim of education, as we have so often pointed out in these pages; but all this ought to be known. Herbert Spencer, Bain, and others have clearly shown the development of the mental processes. It is this need of training, of putting oneself into the position to see as the practical man sees, that is so much required in the teaching of art. The designer needs

to be taught to look on the practical side of his art before he can become a good artist. As the product of the schools, he is now rather a learner of art facts; his mind is stored with models and ideals gained from books and buildings, the results of art classes and schools. So if the modern architect is to become the art-solver of building problems, he must be taught the mental power to deal with these points; that is to say, his mind must be trained and disciplined to meet the difficulties of every new building which he may have to design, and to invent forms or modes of expressing his practical solutions, without any preconceived ideas borrowed from a previous age.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

A FEW years ago we noticed the improvement in the hanging of the pictures at this Society's rooms in Suffolk-street, initiated, we believe, by the President of the Society, Sir T. Wyke Bayliss, F.S.A., and his colleagues. The improvement consisted in reducing the number of pictures, and bringing them down to a convenient distance for sight. Before that period the large, lofty gallery was crowded with indifferent canvases, many were "skied." We must congratulate the President and the committee on a further advance in the decoration of the galleries, which might be followed by other societies with advantage. Having determined upon a convenient sight-line, at a not too great height from floor, the council have carried out a scheme of decoration. The space devoted for hanging has been painted a dark sage green, and this has been crowned by a modelled cornice and frieze decorated with festoons in relief, and picked out in bronze. A low plinth of a lighter bronze has been placed all round to form a skirting. Above the frieze, the wall cornice and cove are left light, and form, as it were, the "sky." The effect is to greatly improve the architectural proportions of the large gallery, and to give a good background to the pictures. The four smaller galleries are treated in the same manner; the friezes are relieved by conventional foliage, modelled, though apparent height is given by the painting of the cornice dark below the cove of skylight. For the carpeted floors polished parquetry of "herring-bone" has been substituted, a more economical and sanitary material.

In the Central Gallery we notice several able works, though the average excellence is rather lower than we have seen it before. Tom Robertson's "Moonrise, Southern Morocco" (2) is a fine study of atmosphere. A sandy stretch of ground, through which a river runs, lined by a few palms, suffused by a sunlight of pale rose, exquisite in its effect of a hot sun. Then we have on the same wall N. Prescott-Davies' "At the Ferry," a young girl clad in diaphanous drapery, a pitcher by her side, waiting presumably for the ferry boat; but the style of the dress and the marble pierhead with its lamp show that it is no ordinary ferry, but a classic conception. The marble seat and alcove are Greek in design. Geo. C. Haite has a fine view of the "City of Tangier," where we see the city with its roofs and terraces bathed in strong light. On the top of one sit a number of groups smoking. Beyond is the green sea. The handling and colour are strong. In the corner hangs a large picture, entitled "An Anxious Moment," by Wright Barker. The scene is a country lane, and in the foreground a farm lad is holding two powerful carthorses, one of which is rearing and about to break away, while the other has his head turned in the other direction. The situation depicted is desperate, and the youth has his work looked out. The restive horse is defiant, and tries to break loose, and the painter has ably

portrayed the movement. The work is full of vigour and the horses are cleverly painted. Robert Morley's "Chateau Gaillard" (21) is a well-known subject well depicted.

Reginald Smith's "Watergate Bay from Porth Island" is a vigorous piece of Cornish coast scenery, strong in colour, and W. J. Laidlay's "Off the South Carr" (29) gives a powerful impression of a stormy sky and sea, with a storm-tossed vessel and broken topmasts. Pleasing in its sentiment and feelingly painted is E. Leslie Badham's "Falling Leaves" (26), a village house and shed and rough field, with lofty trees getting bare of leaves, with the suggestion of autumn in the russet-hued foliage. "A Question of Colour," a young lady in a pink-lined silk dress selecting flowers for her corsage, by W. Hounsom Byles (12); Haynes King's figure study, "While pensive I thought on my love" (19), are clever studies. W. B. Lamond, in his "A Quiet Nook," gives us a pleasing little piece of country—gleams of sunlight through trees. There is a touch of romance in Chas. F. M. Cleverly's "The Devout Lover," a young knight in steel armour clasping the hand of a young maiden who is seated on a bank in a woodland. It is sincere. "A Creek in Peele Harbour," by Fred. Whitehead, must be commended, as well as "Harvesting on the South Coast," by J. F. Darley (35), for its sunlight effect. Robert Morley is a master of animal painting. His "Head of a St. Bernard" (40) is very fine and full of expression in the eyes; and we must also speak approvingly of his "Teazles" (14), "A Highland Shepherd" (157), and his clever portrait group of a lady with her three pet dogs, "A Quartette," in another gallery. Other subjects which deserve praise near the fireplace are S. Grant Rowe's "River Bank," vigorously executed; John M. Macintosh's view, "By Lambourne Stream" (44); J. D. Fergusson's study of a girl's head and hat, "Souvenir of Spring" (45), and over the fireplace Emil Fuchs' clever sketch for the "Portrait of His Majesty the King" (47) in military dress. Val Davis has a charmingly delicate work, "Summer" (50), and Tom Browne one of his clever studies of "A Volendam Girl" (51). "After the Storm," by A. Carruthers Gould, is a charmingly painted seascape, with its grey sea, the waves breaking on a sandy beach and reflecting an evening light. W. B. Lamond's "A Reedy River," and Francis Black's "The Path to the Sea"—a delightful riverscape with trees—are noticeable pictures. Adam E. Precter paints one of the principal figure subjects of the gallery, "The Gift of the Sea" (61), a grey Cornish-looking fishing village, with its steep cobbled street and cottages coming down to the sea. A group of fisherwomen and girls are busy packing the fish, which are plentifully strewn on the beach, into baskets, others in filling barrels with sprats. A large haul of flounders and herrings cover the foreground. The scene is truthful and realistic, the subdued grey light and the glistening fish admirable in effect. Leonard Watts, in "Wild Flowers" (65), paints a bright-haired little girl with poppies in her lap tenderly. Under W. Ayerst Ingram's large blue seascape, "The Isle of Shoals, New Hampshire, U.S.A." (67), is a skillfully modelled figure of a nude girl, "The Dance," by W. Hounsom Byles, painted with scholarly grace and rhythm, and at the corner of room Windsor Fry paints a small allegorical piece, "Eve," in which the golden tresses of the maiden contrasts happily with the green foliage of the trees and their fruit. The president, Sir Wyke Bayliss, gives us one of his noblest and mystic interiors on the "Oriflamme of Milan" (83), rich in colour and excellent in its perspective. Below this work C. F. Lowcock has two bijou studies of classic draped figures, "Pleasant Reflections" (84) and "The Bath" (86), graceful figures of

girls at their toilet. Wynford Dewhurst, in his "Chateau Gaillard," is a pleasing sunlight effect, with the white, lowering, and verdure-clad cliff beyond, with the chateau on its crest, and W. Cave Day's "A Spring Idyll," a child with wild flowers in a wood. One of the principal subject pictures is T. F. M. Sheard's large picture, "A School for Scandal," a group of old women gossips round a tea-table, one of their number is telling a tale which affords great merriment. The expressive faces of the elder women are clever, and as a piece of realism in humble life the subject has great merit. Other subjects of the Hon. Secretary include a portrait of "Mrs. Harry Sowden" (137), and "Summer Spoil" (62). E. A. Fellowes Pryne (96) has a decorative arched panel, "Pan and Syrinx (the Birth of Music)" (96), a well-balanced composition. Amongst other pictures that deserve notice are Paul Paul's "The Road to the Village," through meadows by a river, with village in distance, an evening effect, the light reflected in the river, broad and quiet; Frank Dickson's "Travelling Traders" (100), cottage garden, beyond which a gipsies' caravan is passing; a fine landscape by Frank Spenlove-Spenlove; "The Dusty Road" (107); Hans Trier's fine luminous and hazy view of "Venice"; Walter Fowler's large woodland, "Stirred by the Gentle Breeze of Autumn" (118); "Passing Shadows," by Ivystan Hetherington (119), a landscape in which the sky dominates; and Walter Blundell Thompson's large picture of lions lying on a hilltop (121), called "Still Life"; Hal Hurst's portrait of "Miss Berman" (115) seated on a couch—a fair lady with prepossessing features, in low dress of delicate light fawn and salmon, set off by curtain background—is graceful in pose. No. 105, "The Rain it Raineth Every Day," by John Adamson—a little girl with skipping-rope at her cottage door, surrounded by a Virginia creeper, making a pretty setting to the figure, while the rain is coming down in torrents—is a subject applicable to the present season.

In the South-East and South-West Galleries we must notice the Hon. Secretary's portrait of "Mrs. Harry Sowden," seated, with geraniums and poppies by her side. W. H. Gore's "Contrition," a little girl seated in a room, where she is doing a little penance; and W. Graham Robertson's composition (146), a little boy and girl seated in a garden, very delightful in drawing and delicate in colour. They are indulging in childlike anticipations. Algernon M. Talmage's moonlight scene (138), "When Lingerings Daylight Welcomes Night's Pale Queen," is charmingly true to nature; and we notice some clever sea studies in W. B. Lamond's "Song of the Sea Birds" (136); "Nature's Flying Buttresses, Zorn Point, Falmouth," by Charles Collins, a cavernous rock (140). Philip H. Newman (147) has a large decorative subject over the fireplace, classical in its theme. Geo. C. Haité's large picture, "Queen Victoria's Jubilee, 1897," the procession passing the Clock Tower of Westminster, is an interesting reminiscence (150). Fred Footet's large view of "The Foreign and India Office" (153) is interesting only as a piece of impressionism. With subtle technique the painter endeavours to impart the vibratory effect of sunlight and mist; and a rich jewelled effect is the result. His other picture, "To Morning" (206), shows the effect of dawn and dew in a wood or orchard. As experimental works they have interest. Allan Davidson's graceful figure of a girl in the first step of a dance (155), and Reginald Smith's "Weather-beaten Coast" (161) are also good. Hal Hurst's clever life-size portrait of "Hal," probably the painter's little son (180), dressed in open brown overcoat, white shirt, and scarlet tie, and holding a riding-whip, with top boots, is charming in the delicate grey tones of the wall

of gallery background. Rupert C. Bunny's powerful figure, "The Prodigal Son," in a half-kneeling or crouching position, suffers from its proximity to the last. There are also a few more good pictures, but they are overpowered by commonplace subjects. A large "Nocturne," by A. Moulton Foweraker (195), a large sea piece, "Freshening" (219), by Alex. Maclean, A. Carruthers Gould's "Return of the Fleet" (223), and W. Cave Day's "A Lady in White," may be mentioned as redeeming works. The Water Colour Gallery is perhaps stronger. We notice clever works by Alfred J. Collister, as in "Summer Weather" (240), a village pond, "Shipping" (307), the latter a delightful piece of colour, firm and direct in handling. "A North-country Village," by Arthur Tucker (239), is also strong. "An Errand of Mercy," by Childe Pocock (245), a night scene in a narrow street buried in snowdrifts is pathetic; and there are works by Sylvester Stannard (248-326), E. E. Anderson, as his "Whitby" (268), and drawings by Giffard H. Lenfestey, J. Finnemore, W. Cave Day (288), Paul Brisson, L. Burleigh Bruhl, H. P. Clifford, and W. Harding Smith. A sketch by Tom Browne is full of character, "Volendam Maidens" (329); and there are a few on the screen, as J. W. Schofield's "Vanishing Light" (382). The President has a fine interior drawing, "Old Sanctuary in Bayeux Cathedral" (273), with its beautiful Byzantine capitals; we may also notice P. Fletcher Watson's architectural drawing, "Rue d'Amiette, Rouen" (402). On the whole, the best works, of which there are not a few, suffer from the predominance of works of feeble design and commonplace character.

POPULAR FREE LIBRARY COMPETITION.

FIFTY designs have been sent in for the proposed public library for Bromley, E., and these are on view till to-day at the Council Offices, Poplar. The conditions of the competition required on the ground floor: a lending library, magazine and news rooms, assistants' office, and public and private entrances; on first floor a book store and committee room; and on the second floor rooms for the assistant librarian, with private entrance, besides a basement with lavatory, book store, and heating chamber. These requirements were sketched out in outline by the borough surveyor, Mr. H. Heckford, on the site plan, and we notice most of the competitors have followed the scheme. There designs have been selected by the borough surveyor, who acted as assessor. Design No. 47, by Messrs. Squire, Myers, and Petch, South Kensington, has been placed first, and No. 3, by Mr. A. F. McGregor Milligan, of Liverpool, and No. 39, by Mr. C. Harrold Norton, Bedford-row, W.C., have been placed second. Having so soon to go to press we have only been able to make a hurried inspection of the designs. The design placed first adopts the scheme as proposed by the authorities, which places a lending library between the public and private entrances facing Brunswick-road, and two large rooms, one for magazines and reference, and the other for news room, behind, with a small office for assistant librarian with inspection window between these two, so that they may both, with the lending library in front, be under his supervision. The lending library is 5ft. by 33ft., well lighted by four large circular-headed windows in front, and also by top light on the portion behind, which is kept one story and has an asphalted flat. The entrance lobby and vestibule are of good size, lighted on the south side from an area skylight, the borrowers' lobby projecting into the end of lending library. In the centre, on the inner side is a semi-octagonal room projecting half into the magazine and news rooms for

assistant librarian. At the north end is the assistant librarian's entrance and stairs to his private rooms on top floor, a staff stairs, and book lift, opening to the lending library, also a librarian's room with w.c. and a side area, which gives light and ventilation and at the same time assists to preserve the ancient lights of the houses on each side, a point which some of the authors have neglected. The magazine or reference room, and the news room are each 41ft. by 39ft., top lighted, and also have windows into the back, and on the first floor in front there is a book store with corridor behind and a committee-room. On the second floor, also in front, are the librarian's private rooms, reached by separate stairs. The section shows a well-studied treatment of the reading-rooms behind, with central lantern supported on iron columns, and the front elevation is Classic in character and dignified, mainly of stone. The lending library portion of façade is four bays in length, with engaged Ionic columns between, and standing on the half-sunk basement, and on each side the entrances slightly project, and are carried up as solid masses of masonry, with attic, pierced only by the public entrance on the south side, and by a window on the north. The librarian's dwelling windows are partially obscured by the balustrade. The architectural lines are carried through; the lending-library windows between the columns are circular-headed and wide. The subordinate range of lights divided by small colonnettes above make a pleasing contrast and light the book store and committee-room. The author cubes his design at 11d. and 7½d., the former being put for the front portion, or 9½d. average. The total cost, including heating and ventilation, electric lighting, railings, &c., is £7,500, which is the limit of cost. This plan is compact, and insures control over the departments.

No. 3, placed second, has also a good plan based on the sketch arrangement. The public space for borrowers is rather larger, and is nearly the whole width of lending library, divided by columns from the entrance-lobby on the south side. The lending library is 34ft. by 31ft. 6in., and there is a book store at the other end, the private stairs for librarian's office being placed a little distance from this end. This arrangement is open to question. There is the intermediate supervising office for assistant librarian between the reference and reading rooms behind. The author gets a useful narrow serving-space between the reference library and lending library divided by columns, and in communication with the assistant's central office; but the steps down to this space from lobby are objectionable. The other stories carry out the scheme, and the plan has much merit. The elevation is less successful, though the drawing sent in scarcely does it justice; the projecting entrance on each side of the centre portion, which is set back on first floor, and is adorned by coupled columns and pediments, would be pleasing, but the details are poorly shown. The design is cubed at 9½d. a foot, and the total estimate is £7,497. No. 39, bracketed with No. 3, shows the same general arrangement, but the entrance and borrower's lobby not so well planned. The elevation is Classically treated with flat piers between the windows of lending library. This portion is of two stories, with a story in roof for the librarian's rooms. The corners are rusticated above the entrances and carried up above the central portion. There is a central fleche on main roof, and the general massing is satisfactory, but the drawing is rather rough, and does not do the design credit. There are large octagon lanterns over the reference reading rooms. The estimate is £7,500, and the building is cubed at 10d.

Many other designs show ability. A few of them exhibit a modification of the sketch

plan. In some cases the borrowers' lobby is placed on the inner side of the lending library—without advantage, we think, and certainly less economical; in other plans the building occupies a larger cubic space than the scheme recommends. One or two designs have the assistant librarian's office placed on one side; thereby the supervision of both the magazine and news-rooms is rendered impossible. Side areas are introduced by a few authors to preserve the ancient lights, and one arrangement secures this by placing his main rooms endwise to the front road. No. 5 is a good plan conforming to the surveyor's scheme, and the general arrangement indicates study as to the requirements. Over the centre of lending library a square gallery is shown on the first floor, but the book store is in consequence diminished in size. The magazine and news rooms have circular skylights, and there are good entrances. The elevation is Classically treated and suitable. No. 6, a plain brick treatment, has the board school character, otherwise good. No. 7 has a decidedly artistic treatment on the elevation with high roof—one of the cleverest in the room. No. 46 has also a very artistic elevation, simply grouped with high roof, the entrances carried up as towers with flat cupola terminations. The plan is not so good; there is a large lobby for borrowers. This No. 36 has a Classic exterior, broad in treatment; but the assistant's office is not central, and the newsroom cannot be supervised by this arrangement. No. 30 shows the main rooms running back, lending library on left, and reading room on south side; but the magazine room is a long way behind, and is not easily reached. The centre of front has a lofty, chapel-like end to road between the lending library and reading rooms; the entrances are placed in the centre block. No. 1 is domestic-looking externally; the borrowers' lobby is in the inner side top-lighted. No. 17 has a gabled front, with the object of obtaining the 45° angle for ancient lights; but the effect is doubtful. One design shows the assistant's office taken out of lending library.

THE SOCIETY OF ARCHITECTS.

THE nineteenth annual general meeting of the Society of Architects was held at St. James's Hall, Piccadilly, W., on Thursday evening in last week. Mr. G. Gard Pye, Vice-President, occupied the chair, in the unavoidable absence of the President, Mr. Silvanus Trevail, who was detained by business at Truro. The Chairman mentioned that Mr. Ellis Marsland, the Hon. Secretary, was representing the Society at a mayoral banquet at Salisbury. Mr. C. McArthur Butler, F.S.A.Scot., read the annual report, which was published in our last issue, p. 541. The Chairman, in moving its adoption, referred to its highly satisfactory character, as showing the continued growth and progress of the Society. The increasing support given by architects, especially in the provincial centres, to the Architects' Registration Bill, augured well for the prospects of that measure becoming ere long *in fait accompli*. An important scheme was engaging the attention of the Council, the preparation of a scale of charges to emanate from the Society. The Council also felt that the revised form of building contract issued by the R.I.B.A. was not free from objections, and were considering whether a more equitable form could not be devised. They were also giving attention to the proposed amendment of the law as to ancient lights drafted by the Royal Institute of British Architects and the Surveyors' Institution.

Mr. A. E. PRIDMORE seconded the adoption of the report, which was carried by acclamation.

In reply to a question, the Chairman mentioned that the financial position of the Society was most satisfactory; they had at present a reserve of £700 invested in sound stock, and hoped soon to add another £200 to this balance.

Mr. G. F. Forrest, of the County Surveyor's Office, Wakefield, was elected as a member.

The scrutineers reported the result of the ballot for officers and members of Council. There were

114 ballot papers received, of which eight were rejected as invalid. The following officers were unanimously elected:—President: †Walter W. Thomas, Liverpool. Vice-Presidents: †G. Gard Pye and †A. E. Pridmore, both of London. Honorary Secretary: *Ellis Marsland, London. Hon. Corresponding Secretary: *W. R. Mallett, London. Hon. Treasurer: †H. Goodall Quartermain, Merton. For the twelve seats on the Council there were thirteen nominations, the following being the votes recorded:—†F. W. Chancellor, M.A., Chelmsford, 101; *W. Cooper Hastings, 100; D. Morgan, F.R.I.B.A., Cardiff, 99; R. Frank Vallance, F.R.I.B.A., Mansfield, 99; G. E. Bond, Rochester, 98; Charles Cole, Exeter, 98; *B. R. Tucker, London, 94; *J. W. Dyson, Newcastle-on-Tyne, 93; J. C. Jackson, London, 93; *H. E. Knight, London, 92; *R. G. Bare, London, 91; and *F. W. Macey, London, 85. Not elected, 65 votes. [An asterisk denotes re-election, and a dagger change to a higher office.]

The CHAIRMAN, having invested Mr. Thomas with the presidential badge, the newly-elected President took his seat amid loud applause. In acknowledging his election the President mentioned that he had had some experience of municipal work, having been a member of the Liverpool City Council for the past seventeen years. He should do all in his power to further the progress of the Architects' Registration Bill, a measure which he believed would be in the best interests of the profession and of the public. He trusted that architects would have mutual confidence in each other, eschewing all petty jealousies. He was glad to find on taking office that the financial position was so sound, and it would be his ambition to raise a substantial reserve as a backbone for the body corporate. He hoped to pass on that badge of office to his successor unscathed.

Mr. A. E. PRIDMORE, in accepting the vice-presidency, referred to the projected amendment of the London Building Act of 1894 as demanding the very serious consideration of all architects practising in the Metropolis, and also urged members to use all their personal influence to bear to secure the passing of the Architects' Registration Bill.

Mr. J. R. MANNING proposed a vote of thanks to Mr. Silvanus Trevail for the zeal and energy with which he had discharged the duties of President during the past two years. The motion was seconded by Mr. MEAD, and having been cordially supported by the President, was heartily adopted.

The thanks of the Society were also accorded to the Vice-Presidents, Messrs. Thomas and Pye, to the Hon. Secretary, Mr. Ellis Marsland, to the Secretary, Mr. Butler, and to the retiring members of Council, Messrs. W. R. Bryden, C. Caine, W. L. Grant, and W. J. Jennings, and the proceedings terminated.

COLOUR IN DECORATION.*

By G. H. MORTON.

IMPORTANCE OF COLOUR.

IN a paper that I read before this association at its meeting in Liverpool a few years ago, I said that colour was the "keynote of our craft." It is, undoubtedly, the most important element in decoration, which largely consists in the art of adding colours to a scheme already complete, as regards design and arrangement. The limitation, however, of decoration to colour alone would, of course, be absurd. It must include drawing, design, technical knowledge, and the more practical sides of the craft; but all these seem to me to be secondary to it. An apartment is, as a rule, designed before the decorator begins his work, and if ornament be required, he has an almost unlimited number of designs available in various materials. Consequently, he has not the same necessity to design as he formerly had. Almost all that is required of him is to select the design most fitted to his particular case, taking care that the one determined upon is in accordance with the architectural style of the house and correct in scale, for it is a not uncommon error with these ready-designed materials to use designs utterly out of proportion with the size of the apartment to which they are applied. In the almost unlimited opportunities colour affords the decorator has ample scope, and he cannot give too much study to a subject which will, I think, under any circumstances always remain his chief

* Read at the National Convention of Painters and Decorators at Nottingham.

strength and be a source of so much trouble to those who do not understand it. Most people can appreciate a good colour scheme when completed, thanks perhaps largely to the natural construction of their own eyes; but few are able to work out and attain a really successful result which requires much experience and calculation.

COLOUR IN NATURE.

The usual training of the decorator in the study of colour is, I imagine, to practise the mixture of pigments, try the effects of various combinations in his works, and to study nature. The latter probably receives the least consideration, though nothing, in my opinion, can be of more value than the critical observation of natural effects and natural objects. The harmonies of colours in spring, the fresh bright greens with the primrose and other flowers of the season, the white and grey clouds on the azure sky on a bright summer day in such perfect accord with the yellow cornfields, the deeper tones of autumn, the glorious sunsets, all constitute never-ending subjects for study and contemplation. The more minute observation of the colours of flowers, the relation of their different hues with the colours of surrounding objects, is also most excellent training, and cannot be over-estimated. The contemplation and observation of nature alone, however, is not enough; we must find out the causes of all these effects, and how it is that all nature is so harmonious and so sparing in its use of pure brilliant colour, for the amount of really positive colour is comparatively small. A landscape, for instance, contains far more greys, purples, and neutral tones than bright colours. The artist—I mean the painter of pictures—must realise these effects; but he has, as a rule, his subject before him, and consequently, as regards colour, should have little difficulty. The decorator, on the other hand, has to create his colour scheme; he has nothing before him except in his mind's eye, and it is only by a knowledge of, and regard for, something more than the simple observation of nature that he is enabled to realise his ideas, and bring them to an ultimate and successful issue. Even when a drawing is prepared beforehand it is of little value except as suggestion, for all the colours indicated have to be altered or modified in the actual work, if it is to be successful. To copy the colours exactly would seldom give a satisfactory result.

THREEFOLD CHARACTER OF COLOUR.

To properly understand and appreciate colour it seems to me necessary to recognise its threefold character: light, the construction of the eye, and the colour properties of natural objects. Natural light is the source of all colour. Ample means should therefore be provided for its admission into our rooms, not only because more beautiful colour effects are possible, but because a light room is healthier than a dark one. The compound and complicated nature of white light was first clearly demonstrated by Sir Isaac Newton when he accidentally discovered the "solar spectrum." Professor Tyndall gives an interesting account of this discovery. He said that Newton went to work in this way. Through the closed window-shutter of a room he pierced an orifice, and allowed a thin sunbeam to pass through it. The beam stamped a round white image of the sun on the opposite wall of the room. In the path of this beam Newton placed a prism, expecting to see the image of the sun, after refraction, round. To his astonishment it was drawn out to an image with a length five times its breadth. It was, moreover, no longer white, but divided into bands of different colours. Newton saw immediately that solar light was composite, not simple. His elongated image revealed to him the fact that some of the constituents of the light were more deflected by the prism than others, and he concluded, therefore, that white solar light was a mixture of lights of different colours. All the colours of the spectrum are caused by the different lengthened vibrations of which white light consists, and may be considered primary colours. Hence there can be no such thing as a three-fundamental colour theory in regard to the prismatic colours. As regards colour sensations, however, it is different. The most recent scientific researches and practical experience point distinctly to three principal or primary colour sensations. Colour, as we all know, does not really exist outside ourselves. The different-lengthened vibrations of light could only be regarded as different degrees of light or heat, were it not for the peculiar construction of the eye, which responds to the vibrations of light and

produces sensations we name colour. Of the eye, Helmholtz has said: "If any optician sent him an instrument so full of defects he would be justified in sending it back with the severest censure." With all its defects, however, it has been calculated that the eye can discriminate the addition of the 360th part of white to any particular colour, and, according to Aubert, it can discern not less than two million distinct tints. With one portion only of it are we now concerned, the retina, which consists of ten different layers. One of these divisions, the so-called layer of rods and cones, has the property of appreciating the sensation of light and colour. The rods and cones seem each to have their peculiar function, and though probably both serve as elements of light, it is more especially the function of the rods, whilst the perception of colour is due, possibly exclusively, to the cones. Near the centre of the retina is a yellow spot called after its discoverer, "the yellow spot of Sommering," which is always used in direct vision, and is sensible to all the colours of the spectrum. Proceeding further from this central spot, at first the absence of red appreciation is noticed, then of green, and finally of all colour appreciation. The arrangement of the rods and cones accounts for this. The yellow spot consists exclusively of comparatively long cones close together, and therefore keenly sensitive to all colours. Gradually the rods or elements of light make their appearance as we proceed further from the centre, until they predominate. Here the colour sense becomes less, whilst the sense of light is improved. When the region of colour-blindness is reached the cones appear to have lost their outer limbs, and otherwise degenerated.

PRIMARY COLOUR SENSATIONS.

The rods and cones—or rather the cones—seem to consist of three sets of nerves which respond to certain vibrations of light, and produce the sensations of three fundamental or primary colours. One set, being stimulated by the strongest vibrations, produce the sensation of red. Another set being acted upon by the vibrations of medium length, produce green, and the third set, responding to the short and weak vibrations, produce the sensation of violet. All vibrations, however, may, and probably do, act on the three sets of nerves simultaneously, but those that produce red, green, and violet effect most powerfully the set of nerves designed for their reception. The secondary colours are the result of two sets of nerves being excited simultaneously or in rapid succession. Blue, for instance, is the effect of green and violet, yellow the compound impression of green and red. The intermediate vibrations affect the three sets of nerves in various degrees, and produce compound colours. Upon the three sets of nerves being excited together in their proper relative proportion, white is the consequence.

COLOUR-BLINDNESS.

If this theory of the rods and cones is true, and there is ample evidence that it is, we may assume the existence of a colour sense wherever we find the cones, and to mark it absent wherever they are absent. A defect in their arrangement probably causes colour-blindness. It is well known that colour-blind persons are usually unable to perceive the red rays, though cases occur when they are blind to other colours and keenly sensitive to the red—indeed, the partially colour-blind as a rule appreciate more intensely the colours they are able to perceive than persons possessing the normal sense of colour. The number of colour-blind persons is larger than is commonly supposed. According to Prof. Rood, "It has been estimated that in England about one person in eighteen has an imperfect colour sense." It is remarkable, however, that the affliction is almost exclusively peculiar to the male sex, women being comparatively free from it. Often the colour-blind are for years unconscious of their defect, and it is extremely difficult to demonstrate the fact to them. When we consider the theory of the rods and cones, and are aware that a slight difference in their arrangement causes a proportionate difference of colour perception, and knowing that we are all subject to slight differences, it would appear probable that each individual is affected by the vibrations of light to a different degree, or, in other words, that possibly no two persons see colour exactly alike. The effect of colour differs very much in different persons. I was acquainted with a literary man who, having had his study papered with a bright red paper,

became so irritable and excitable that he could not settle to his work. I suggested a more soothing olive tone, and happiness and good temper were restored to him. Some time ago I was asked by a lady to report on the decoration of her house. She explained that it had been done a few months previously, and that having a great partiality for red, the rooms were mainly that colour, but had faded terribly. I called, and was overcome by the intensity of the scarlet hall—in fact, scarlet everywhere. On my client's appearing I told her that the colour was not fading, but that, owing to her being surrounded by so much red, she was gradually becoming colour-blind to that colour. This rather alarmed her, and resulted in the red being obliterated everywhere, except in the hall, and that considerably dulled. Somewhat analogous was the experience of the observer who, to test the effect of coloured light upon the eye, wore, for several hours, spectacles provided with ruby-coloured glasses, and this prolonged action of the red light on the eye finally to a considerable extent tired out the nerves excited by the red vibrations, so that on removing the spectacles they saw only two colours in the spectrum. Red was not visible, just as in the case of those who are actually colour-blind to that colour. All red objects appeared dull green or brown.

DEVELOPMENT OF THE COLOUR SENSE.

It has been suggested that the colour sense has gradually developed. That some four or five thousand years ago our ancestors were only able to perceive light and shade, and that modern colour-blindness is, as it were, the reversion of this time when all were colour-blind. No doubt the human eye has, through long ages, gradually improved, and, like our other senses, become more refined. We are now able to distinguish and appreciate more subtle harmonies of colour than our forefathers of a more barbarous time, or the savage of to-day, who would probably prefer very crude colours, as he would prefer the beating of the tom-tom to a Beethoven sonata. In ancient literature we find the names of colours unrecorded, and from this fact it has been argued that at an early period the organ of colour was but partially developed. An equally probable explanation is that in ancient times there were few colour terms. Green and blue being so common in nature would naturally at first be unnoticed, and, therefore, the oldest writings first record red and yellow, the more exceptive colours, and it is not till a later time that the names of the more general colours are given. Ignorance of colour terms is often met with at the present time. Many persons are unable to name a colour correctly. It used to be a method of testing colour-blind persons to require them to name a particular colour, and it was often erroneously concluded that those made to do so, or who named it incorrectly, were at least partially colour-blind, when the defect was not in the eye, but simply in not knowing the name of the particular colour. The method, I think, that is now generally adopted is to mix a number of variously-coloured wools, and require the person being tested to sort them out, placing each identical skein together. The mistakes made by the colour-blind are often very remarkable.

COLOUR EFFECTS.

That the eye tires of one colour, though keenly sensitive to another, is well known, and as the weariness increases so also does the ratio of a more intense appreciation of its complementary. The particular nerves most excited are naturally wearied by the effort, while those unaffected are not only able to respond to their particular colour, but in consequence of the action on their wearied fellows, able to appreciate it in a far higher degree. The effect of any colour upon the eye is rendered more vigorous when preceded by its opposite, or complementary colour, more indistinct when accompanied by other similar colours, and more light or dark respectively when in association with deeper or lighter tones of the same hue. Perhaps the most agreeable impressions are when colours are attended or followed by their complementary tints, which, if combined, would produce white or grey, perhaps the least agreeable, and certainly the most detrimental, when one primary colour is viewed for a lengthened period of time. Though no impressions are actually painful of themselves, they may be disagreeable and injurious to the eye. Some authorities hold the opinion that there is no such thing as a colour discord, but I think that there may be quite as much want of harmony in colour

to the trained and refined eye as there is in music to the educated ear. The impression of one colour on the retina seldom if ever occurs; it is generally excited in conjunction with at least a small mingling of the other remaining colours, which together would produce white. We probably therefore never see colours absolutely pure. Were we to do so, they would be so intense as to dazzle the eye by their brilliancy.

HARMONY OF COLOUR.

In all colour combinations it is essential that the different acts of nerves should be excited, so that no one set will be unduly tired and injured. This is what constitutes true harmony of colour. It is absurd to talk of harmonies of red, or any other single colour; there can be no harmony where part of the whole is only concerned. In a discussion that followed a paper I once read on "Colour Harmony," I was taken to task on this point: "How was it," I was asked, "that a yellow cornfield with red poppies was so harmonious?" I replied, "They are not harmonious of themselves, you have forgotten the large expanse of blue sky," which with the yellow and red constitutes an almost perfect harmony, and practically excites all the colour sensations. In this connection it is important to notice that all visible colour be taken into account. A room decorated in reds in which no opposite colours were permitted might be very harmonious in daylight if it had a large window looking on to a green lawn; but at night, when the green was shut out, it would be hot, oppressive, and unharmonious. The colour of artificial light has a marked effect on decoration; as, for instance, greenish glebes in a red room not only neutralise the red, but directly excite the nerves responding to green. Globes of strong colour, especially red, are most objectionable, and might, if long continued, affect the eye and produce partial colour-blindness. The effect of stained-glass is somewhat analogous, for the light in passing through is intercepted and some of its rays destroyed; hence it is not white, but coloured, light that affects the eyes and tinges every object in the room its particular colour. It seems to me essential that where bright colours are employed there should be a proper balance of harmony, so that no one colour will unduly affect the eye. As a rule all coloured glass should be fixed above the eye level, and there should not be too much of it, for the brilliancy of the colours in glass more powerfully affect the eye than the colours in painted decoration. When pale tints are adopted they should be selected with the object of counteracting any excess of one colour in the decoration. Soft yellow tones, for instance, in the upper sashes of a room decorated in violet or purples produce a wonderfully beautiful effect, changing what would be a cold room into a sunny one. A remarkable colour effect is the change of hue colours undergo where lightened or deepened. As a rule white added to a colour produces a bluer hue, or colour deepened assumes a redder hue. Similarly different degrees or intensities of light produce like results. A strong light gives colours a bluer hue, or weak light produces a redder hue. This change of hue is explained by the fact that, light consisting of vibrations of different strengths, the strong reds continue to act after the weaker blues are quenched. The colours with which shadows appear tinted is peculiar. They frequently present the hue of an opposite or complementary colour; thus the shadows on a red wall appear tinted dull green, and those on a yellow wall often present a tolerably distinct purple. As a rule, shadow effects are to the advantage of a colour scheme, and seem to indicate that the eye will have relief somewhere, if not provided by the decorator. In a scheme of one colour, the adopting of different hues of a colour instead of adhering to one seems to me important, and denotes the modern method. It used to be considered very necessary to "match" a colour, so that the same hue would pervade the whole scheme; but now we find that better results are obtained by using what might be called contiguous hues. A red scheme, for instance, is much more pleasing and satisfactory if different hues are placed in juxtaposition, as, for example, reds varying from orange to purple, or a green scheme consisting of bluish and yellowish greens.

HARMONIOUS PROPORTION.

The harmonious proportion of colours has undergone considerable change since Field published his "Chromatic Equivalent." According to it harmony was obtained by the proportion of blue 8, red 5, yellow 3, in their simple form or

however intricately combined. Professor Rood, dividing white light into 1,000 parts, arrives at a very different conclusion. If I am right in reducing his figures so as to correspond with Field's 16 parts, we arrive at something near blue 4, red 4, yellow 8, figures almost the reverse of Field's. I think Professor Rood's result is borne out by experience. We can endure more yellow than either of the other two so-called primary pigments, red or blue. Yellow being a compound colour, sensation also supports it, for yellow, exciting as it does two sets of nerves, red and green, will be less fatiguing to the eye than a colour which excites only one set. The relativeness of colour is well known, and indicates very clearly how impossible it is to judge of the ultimate effect till a scheme is complete. Persons often interfere (decorators know too well) while work is in progress, and thereby often spoil a fine work. Colours change considerably by the association of other colours. Experiments illustrating this chameleon-like property are perhaps the most interesting and profitable that can be made. Chevreul illustrates a large number. Grey on red appears pale green, and on green appears a dull pink. Some blues may be made to appear blue or green; and, in fact, the hues, tones, and shades of every colour may be materially altered by the introduction of adjacent colours. All colours can, therefore, only be judged in their proper positions, and in juxtaposition with the other colours of the scheme. It is, I think, a safe assertion to make that, if a colour scheme is to be satisfactory when complete, it cannot possibly be so when partly done.

CAUSE OF COLOUR IN PIGMENTS.

I have said that all colours are caused by the action of light vibrations on the retina of the eye exciting sensations we name colours. Yet we cannot say that colour is due to this cause alone. Were it not for the power which natural bodies have of selecting their own particular colour the phenomena would be incomplete. No natural body actually creates colour. It simply absorbs a part of the light shed upon it, and rejects the remainder. The portion so rejected, and not that retained, determines the colour. The common explanation is that each object actually changes the light to its special colour; but that this does not occur has been experimentally proved. The coloration of pigments, of flowers, of green leaves, indeed, of all things, is due to this combination of reflection with the phenomena of absorption. Coloured light must be reflected or it would be invisible. All colour pigments are composed of minute particles mixed with a vehicle that has the power of sifting the white light shed upon them, and selecting and destroying certain rays whilst the particles reflect the remainder. The condition of the petals of flowers and of green leaves is just the same. A white lily, for instance, if it were quite smooth, would have the appearance of thin glass. It is, however, composed of a vast quantity of minute cells, so that it resembles finely-powdered glass, from each little particle of which light is reflected backwards and forwards, and there being nothing in the lily to cause the selection of one ray over the other, the light is white. A scarlet geranium is similarly composed; but its particles or cells are infused, as it were, with a colour matter which absorbs or devours all the green and blue rays, and unabsorbed scarlet is reflected. All green leaves owe their colour to the same cause—light passing backwards and forwards through an absorbing colour matter which extinguishes the red rays, and on being reflected back to the eye excites the sensation we call green. The colours of pigments and of all natural bodies are therefore the unabsorbed rays of light shed upon them. Many substances superficially reflecting coloured light prove this to be the case, as many aniline dyes, compressed indigo, &c. Gold, though generally believed to be yellow, is found to be a bluish-green colour when light is passed through a thin layer of it, and perhaps demonstrates as clearly as anything else the phenomena of absorbed and reflected rays of light.

COLOUR COMBINATIONS.

The mixtures of pigments produce very different results, as regards lightness and darkness, to the combinations of coloured lights. Red and green pigment, for instance, when mixed together, produce a dirty-brown colour, due to so much light having been destroyed, for the red pigment absorbs the green and blue rays and the

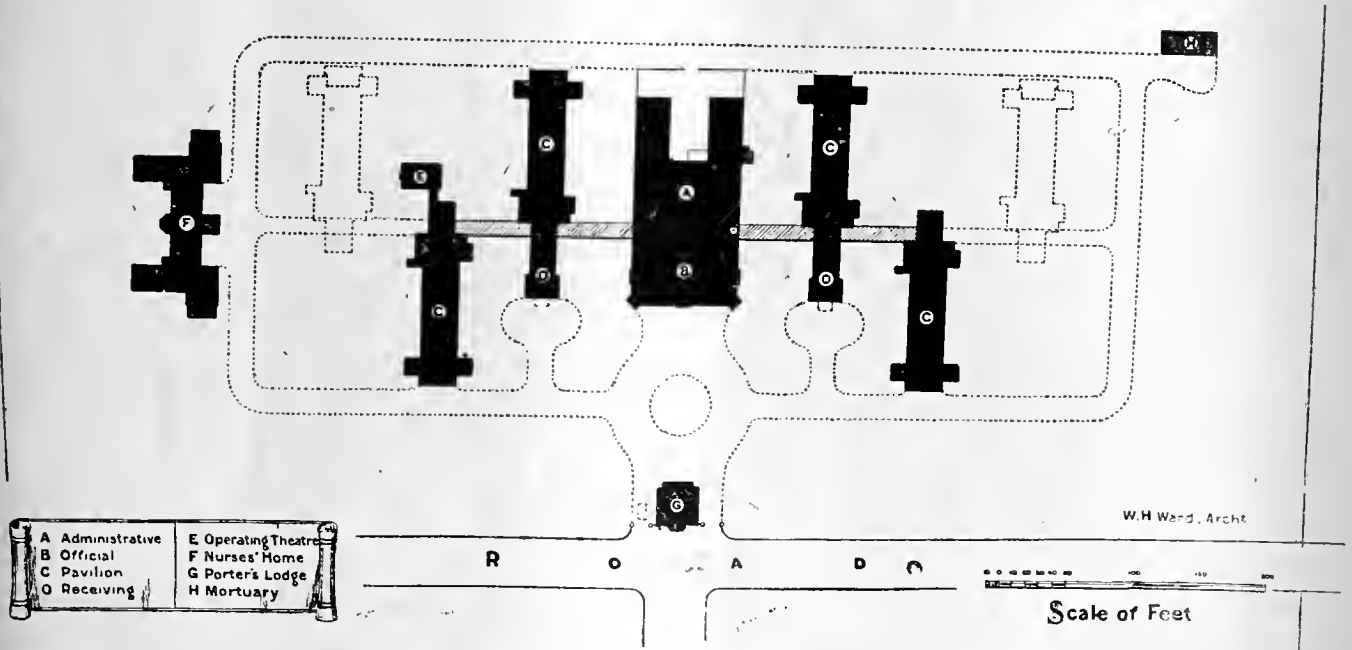
green absorbs the red rays; consequently, yellow only remains, but is overpowered by so much light having been destroyed. It is almost equivalent to mixing one-third yellow to two-thirds black. The combination of red and green light, however, is almost the reverse. No light is destroyed, but increased, for two lights must be greater than one; hence the yellow produced by red and green light is lighter and brighter than either of these colours singly. The mixtures of colours as constituents of light seem to me to be the true mixtures of colours, and can be easily attained by revolving discs, so made as to partially overlap each other and expose both. Two such discs of different colours when made to revolve rapidly produce a compound colour lighter than either of the colours separately. An instance of the different results obtained by the combination of coloured lights than by pigment mixture was pointed out to me by an artist friend who had travelled in Egypt. He noticed the dome of some building at Cairo, I think, coloured a pale green tone, and wondered how so bright a colour could be obtained in a position where there was no direct light. He got up for a nearer inspection, and found that instead of green the dome was dotted all over with spots of the brightest blue and yellow exposing a white ground. At a distance the colours seem to combine and excite the impression of pale green of a particularly light and beautiful tone, quite impossible to obtain had the same colours been mixed together as pigments in the ordinary way. From my remarks it will be seen that the study of colour is deeper and goes farther than the simple observation of nature. This is amateur's work, and is more or less practised by everyone having an observing eye. It seems to me that more attention should be given to the science of colour, so that we may be the better able to realise our ideas, for I am of opinion that the carrying out a scheme of colour is as much a matter of scientific calculation as of artistic conception. The requirements of the human eye have also to be taken into account, for the eye is a delicate instrument, extremely sensitive to colour, which, if properly used, benefits it; but if badly used, it suffers in consequence. Colour is, therefore, not only an aesthetic gratification or pleasure, but the frequent and continual change from one colour to another is a physical necessity, and worthy the careful study of every decorator who feels that the most important part of his craft is colour.

THE CARE OF A HOUSE.*

THIS is a volume of suggestions to householders, landlords, tenants, and others, who have the care of dwelling-houses, and, though its author hails from Boston, in America, the contents of the work will be found of service to the same class of persons in this country. Mr. T. M. Clark is a Fellow of the American Institute of Architects, and his remarks are, therefore, of practical value to all interested in building houses. The first chapter deals with the construction of a house. He refers to the increasing preference of Americans for independent home life, notwithstanding their habit of dwelling in hotels and apartment-houses, and he says there are few tenants of the latter who do not look forward to the time when they can have a home of their own, an inclination which seems to be inborn in the English-speaking race. The author points out how the independent house can be made structurally sound; how its present defects may be avoided, and the burden of those who inhabit them may be lessened—observations which apply equally to hundreds of our own modern-built buildings. As he says, the source of many of the worries attending housekeeping is unknown to the majority of tenants. They have no knowledge of house construction, of plumbing, heating, and other matters. The author describes the mode of building timber houses so largely seen in North America, and the mode of constructing the frame of studs, usually placed 16in. apart, and covered externally with rough boards and "clapboards" or shingles; and internally with laths and plaster. This construction is well known to our readers, and need not be dwelt on. It may be instructive to learn that the rafters are placed about 20in. to 24in. apart, and are covered with boards and shingles. These distances between studs and rafters are therefore much

greater than with us. No mention is made of trussing; but the partition studs stand on girders or heavy beams supported by brick piers in the basement, and the interior partitions have the studs resting on the floors. Sketches are given of these partitions and floors. The spaces between the joists are used for hot-air pipes, plumbers' pipes, gas-pipes, and electric wires—a source of annoyance and danger. Simple rules are given how to find the direction the boards run, so that they may be removed in cases of leakage of gas, &c. Below joists the plaster of ceiling often shows white lines, while the interspaces are impregnated with smoke and dust, thus indicating the direction of the joists. Structural weaknesses, shrinkage cracks, settlements, are noticed. It is useful to know that cracks generally are at right angles with the direction of settlement. By careful diagnosis, it is not difficult to distinguish cracks due to settlement, shrinkage from those due to bad plaster or want of hair in the mortar. Under the heading of "Roof," the author speaks of coverings, including shingle tiles, which he considers the best of all roofs, hard burnt or brown tiles and slate; the latter is considered inferior to tile roofs, and more exposed to be shaken in high winds. Shingle roofs are more efficient in high winds; but they soon rot in the valleys. Speaking of the pitch of roofs, the minimum recommended is $26\frac{1}{2}$ degrees, or quarter pitch. This applies chiefly to America, a higher pitch is preferred, however. The shingles, tiles, or slates should be put on over two layers of waterproof felt tacked on the boarding. For flat roofs, copper, tin, or composition made of tarred felt in three or four layers, mopped with melted tar and covered with gravel, are used. The remarks on flashings are to the point. Chimneys and fireplaces are often faulty. The stack above roof, if high, is apt to leak, owing to the mortar decaying under the action of rain and frost. An 8in. by 12in. flue is recommended for open fireplaces. Mr. Clark describes the effect of currents of air, its clinging to surfaces over which it passes, so that any obstructive building or hill deflects the current; the suggestions made to remedy down-draughts are sensible. A semi-cylindrical cap of brick or metal, its axis at right-angles with the downward current, is a good preventive. A tapering top is also of value by inducing upward currents of wind which strike it. A good plan of fireplace and section showing a contracted throat to flue just over the fireplace are given here. The sides of fireplace should, of course, be bevelled for radiating heat. When the back is drawn forward to form the "throat" of flue the author says it should form a mere slit about 2in. wide, and just behind a level shelf of brickwork is required to repel downward puffs. The narrow throat prevents cold air entering and checking the ascending gases. These principles are, however, well-known by all practical builders of fireplaces and flues. Useful rules are given for diagnosing the cause of smoky chimneys. The remarks on stoves and furnaces are instructive, and every householder should understand the principles involved, and those are explained. Stoves with iron pipes carried up to the ceiling, controlled by a damper in the smoke flue and slides, are noticed also. "Base burners" and jacketed stoves are described; the latter is an improvement on the ordinary stove, as the iron casing retains the heat and imparts it to the room through grated springs. The kitchen stove and furnaces are discussed in two other chapters, and the next is devoted to "Steam and Hot Water Heating." The author says: "Of both these systems of heating there are two varieties, the direct system by which a radiator, through which the hot water or steam circulates, is placed in the room to be warmed, and the indirect system, by which the radiators are placed in the basement, and serve to heat a current of fresh air which is brought in from the outside, and after warming is conducted to the room to be heated. The obvious advantage of the latter method is that the rooms are not only warmed, but supplied with fresh air; while under the direct system no fresh air is introduced, the radiators serving simply to heat the air already in the room." This distinction is well pointed out, though in practice the two systems are often used together, the larger rooms being warmed on the indirect plan from the basement, while the halls and chambers are heated by radiators in the rooms. The advantages and disadvantages of each system are pointed out; the author prefers the indirect system for the constant supply of fresh air intro-

* The Care of a House. By T. M. CLARK, F.Am.Inst. Architects, &c. With illustrations. London: Macmillan and Co., Ltd.



STOCKPORT NEW INFIRMARY.

duced, and for its less liability to freeze; but it is more expensive; the direct system is cheaper, and more easily managed. Hot-water heating is fully treated, and its conveniences are pointed out; the narrow limits within which a steam radiator can be varied in temperature is one of its drawbacks. With hot water the radiator can be varied to any degree, and it is not necessary to keep up a bright fire through the night. Hot-water heating is also less oppressive than direct steam heating. The difficulties attending the management of both systems are dwelt upon; also ventilation, which is often a source of trouble in both the systems of heating. The evils of imperfect circulation are made the subject of remark; the theory of circulation is explained, and the evil of "traps" for air-bubbles in the pipes without means of escape mentioned. Advice is given on the arrangement of the pipes, the mischief of dips or bends downward, the remedy for "hammering" in steam pipes is clearly pointed out in the "single-pipe" system. Of course, "hammering" is caused by the collision of the steam with the condensed water in the steam pipes; they should be kept apart or made to move in the same direction. We cannot enter into other chapters which treat of plumbing inconveniences and remedies, a long chapter in which much information is given and remedies for troubles suggested. This portion of the volume occupies a large space, and no doubt more than half the troubles of householders and tenants proceed from bad plumbing. The chapter on electrical fixtures, and the remarks on the care of woodwork and keeping a house in repair are worth reading.

An attempt is being made in Leicester to raise £30,000 for the purposes of church extension.

STOCKPORT UNION NEW INFIRMARY.

THE foundation-stone of this large institution was laid a week or two ago at Stockport. The plan and view given to-day show the extent of the buildings, which are being erected from the design of Mr. W. H. Ward, of Birmingham. The site is at Stepping Grove, near Hazel Grove, covering some 26 acres of land. The building contract is a trifle less than £40,000, and it is expected that the total outlay will reach about £50,000, including the furnishing. Cottage homes will be erected for the housing of children, but the old workhouse will be retained as well.

ON BUILDING TIMBERS.—XL.

MEASURING.

IN proceeding to ascertain the solid content of round tapering timber, the nature of the process will be determined by the object to be attained when the measurement and calculations are complete. To measure round timber which shows no regular geometrical figure or cross-section with mathematical accuracy is, as has already been stated, an impossibility; but a very close approximation to the actual content can be obtained by dealing with—say, the trunk of a tree, as if it was actually the geometrical solid to which it approaches most nearly in shape. The content obtained in this way is "actual content," and when the object of the measurement is to obtain the true content, this is the only way of proceeding; but, as the main object sought in measuring round timber is not to obtain the true content, but some figures which, when elaborately juggled with, will give much less than the true content, a different method of calculation must be adopted. The word "content" should be taken to mean

the true content and no other, for "Sale Content," "Content by Hoppus," and content by "Auctioneer's Measure" are not contents at all. They are considerably under the content, and they bear no definite relation to actual content, so that it is not possible to apply a "coefficient of safety" to any of them! A timber merchant naturally likes to buy his round timber by these sham contents, for he gets much more than he pays for; but he would be the first to object to a publican serving him with a quart of ale measured on the same principle—that is by "Hoppus's quarter-girt." It is said as an excuse for this under-measurement that there is much waste in converting a round log, and that when the sapwood is removed the net amount of wood left is really not more than what Hoppus's measurement represents it to be; but this is not true, and even if it were, the timber owner should have the actual contents of his timber stated, together with the percentage allowed the purchaser for waste. An amusing and interesting correspondence on the subject was published in the *Land Agent's Record* for 1887 and 1888. Professor Curtis a practical forester, gave a rule for ascertaining the cubical contents of timber—viz., length multiplied by the square of the average quarter-girt; but a correspondent, who signed himself "A. H.," and who evidently knew what he was writing about, promptly joined issue with the professor, and pointed out the absurdity of the rule, and the errors which must result from its adoption. "It would be a matter of little consequence," writes "A. H.," if the error were in a fixed ratio to the true quantity, as it could then be met by a fixed appreciation of the true price; but the difficulty is that the error increases with the taper of the tree. In fact, the rule applicable to a square prism is erroneously applied to the

frustum of a pyramid. As well might we attempt to cube up a cone by applying the rule for a cylinder. The *reductio ad absurdum* of the rule is "that the top half of the height of a cone equals that of the bottom half!" Subsequently, Mr. Robert Anderson and Mr. Daniel Watney supported "customary measure," with the assistance of three "ingenious" gentlemen, whose "attestations" were cited by Hoppus over 100 years before; but "A. H.," again writing under the nom de plume "X.," manfully stuck to his guns, and routed professors and authorities, after showing the inaccuracy of their rules, and that this inaccuracy was studiously maintained, because it was wholly in the interests of the "trade." "A. H.," who was a mathematician, knew well the only correct way to obtain the content of tapering timber, and he also knew that Hoppus, and all who followed his method, could not obtain that content, and did not want to do so. To take the trouble to show that Hoppus's quarter-girt method is absurd is to flog a dead horse. In "Mullisicium Mensionis, or the Marrow of Measuring," by Venerus Mandey (1698), the following rule is given for finding the content of a conic frustum:—(1) Find the superficial content of the lower end; (2) Find the content of the upper end; (3) multiply one content by the other; (4) extract the square root; (5) add this square root, and the content of both the bases together, all three in one sum; and (6) multiply the last sum by a third part of the length for the solid content required. This is practically the third rule and formula given in the last article. After giving an example carefully worked out according to this rule, Mandey begins a page with "An Advertisement" to this effect:—"The usual way which a great many men use in measuring such a piece of timber or stone, is this, which is a false way, and finds a Content less than the true Content. They take the Sides of the Square about the middle of the Piece, and this Square of the middle of the Piece they suppose to be a mean Square between the greater end and the lesser end; then they multiply the Content of this Square by the Length of the Piece." For round timber it will be only necessary to read "area of the circle" about the middle of the piece, for the "sides of the square," &c. Mandey then calculates the content of a log 20ft. long, 20in. square at the greater end, and 12in. square at the lesser end, by the true way it is 36ft. 3in. 6 parts 8 seconds. Calculated by the usual, but false, way, it produces 35ft. 6in. 8 parts, "which Content is less than the true content by about three-quarters of a Solid Foot, which in measuring of a great quantity of Taper-grown Timber would be considerable."

Writing about the same time, William Hawney, "Philomath," said: "The usual Way to measure round Timber-Trees is to girth them about the middle with a String, and take the fourth Part of that girth for the Side of a Square, by which they measure the Piece of Timber as if it was a Square. But that this is an error, I shall make appear as follows: If the Circumference of a Circle is 1, the Area will be .7958; then the fourth Part of 1 is .25, which squared make .0625; this they take for a mean Area instead of .7958; therefore, the true content always bears such Proportion to the Content found by the aforesaid Customary false Way, as .0625 to .0625; which is nearly as 23 to 18; so that in measuring by that customary false Way, there is above the one-fifth Part lost of what the true content ought to be. This Error, tho' it has been so often confuted, yet it is Grown so Customary in all Places that there is little hopes of my prevailing with men that are so wedded to it to embrace the Truth." Hawney here refers to the measurement of timber which is cylindrical—that is, to logs the ends of which are equal—and he gives an example of how the true, and customary false, contents of a log are ascertained, the latter being in this case 72ft., as against 91.67ft., the true content. Speaking of the measurement of round timber whose bases are unequal, he says:—"The usual way to Measure round Timber (as I said before) is to take a fourth Part of the Girth in the Middle of the Piece for the side of a mean Square. But this way I have prov'd to be erroneous in Timber that is all the Way of equal Thickness, and it must be made more so in Timber that is tapering, and the more tapering it is the greater is the Error. For to the Error in the last Section there is added the Error in the third section; therefore to measure all such Timber according to Art and Truth, such a piece ought to be considered as a Frustum

of a Cone, and should be measur'd accordingly." Hawney's rule for obtaining the solid content of the frustum of a cone is expressed in this way: "To the Rectangle of the Diameters of the two Bases add the squares of the said Diameters, and multiply the same by .7854, the Product will be the Triple of a mean area; while, multiplied by one-third of the perpendicular height, that Product will be the solid Content." This is practically rule No. 1 of last article. He also gives this rule: "To the Rectangle of the greater and lesser Diameters add the third Part of the square of their Difference, and multiply the same by .7854, the Product is a mean Area; which multiplied by the perpendicular height, the Product is the solidity." Stated as a formula, the rule would be like this—

$$D \times d + \frac{(D-d)^2}{3} \times .7854 \times H = S.$$

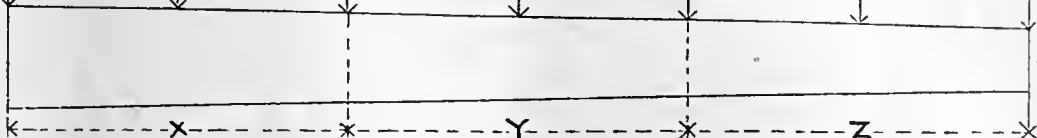
In the "Builder's Dictionary," by Richard Neve, "Philomath" (1726), the customary way of measuring round timber is stated to be by quarter-girth. The tree is girded about "in the middle of the length, and folding the line twice (to take a quarter of it), they account that for the true side of the square," which of course it is not; "then for the length, it is counted from the Butt end of the Tree so far up as the Tree will hold half a foot girt." The quarter-girth being squared and multiplied by the length the content is not obtained. In measuring oak for sale an inch was always cast out of the square for the bark, that is, "if a tree be 10in. square, they measure him as if he were true 9in.; but for Ash, Elm, and Beech an inch is too much to be allowed for Bark." Neve adds that this way of taking quarter of the circumference for the true square is erroneous, for it always gives the solidity less than the truth by about a fifth part. A very peculiar way of measuring hewn unequal-sided squared timber was common about the end of the 17th century: the width and depth of each piece was taken by caliper measures, these dimensions were added together, and half their sums was taken for the side of the equivalent square, this method of measuring always gave the content more than the truth, and the greater the difference of the sides the greater was the error. Neve says that in his time, though the method of taking the dimensions of square and round timber was erroneous, custom had made them current. John Darling wrote a book on measuring in 1738, called "The Carpenter's Rule Made Easy," and in it he notices the common errors made in measuring timber both square and round. He prefaces his rules for ascertaining the content of timber by explaining the "errors many men, who undertake to measure timber, fall into," these are the "squaring" of rectangular hewn timber by taking half the sum of the unequal sides, and for round timber, taking "girth measure," he makes the following quaint remarks about quarter-girth measure, "I have heard some carpenters say that they did believe there was something more in a round piece of Timber so measured as before. But they say by the time we have paid for squaring of the piece, we find but little profit in buying it round. For all we hew off according to your measuring is a loss of so much timber as we pay for." Darling's rule for finding the content of the frustum of a cone is stated in this way: "To the area of the semi sum of the diameters add one-third of the area of the semi difference of the diameters, multiply the sum by the depth, and you have the content." Here the expression, "Area of the semi sum of the diameters" is incorrect, for the diameters, being lines, can have no areas. Consequently the areas referred to are those of circles having diameters of the dimensions given. A. Fletcher ("Philomath") wrote his "Universal Measurer" in 1776, and he has a tilt at the customary mode of measuring round and square timber. After describing how the quarter-girth is taken, and squared, he says, "this is the method generally practised, because of its ease and expedition; but it always gives the contents too little, so those that buy round timber by this measure have nearly one-fifth part allowed for chips, and more if the timber be tapering." Fletcher points out that if the diameter of a circle is 12in. its area is 113.0976in.; but he does not point out the use of this sum as a divisor for ascertaining the contents of timber, as Mr. Burt (chief measurer at the Surrey Commercial Docks) does in his "Standard Timber Measurer"; probably because custom was so much in favour of erroneous methods it was useless to offer any

other. Hutton's "Mensuration, both in Theory and Practice," published in 1770, gives correct rules for measuring the frustum of a cone, some of which, as they are already given above, need not be repeated here; one, however, that has not been stated may be of use: it is this—

"Multiply .2618 ($\frac{.7854}{3}$) by the height, and

the product by the quotient arising from the division of the difference of the cubes of the diameters by the difference of the diameters." It need scarcely be said that all rules for finding the content of the frustum of a cone are derived from that for finding the content of a pyramid which is the arc of the base multiplied by one third the perpendicular height. Hutton gives a rule for finding the content of round timber "extremely near the truth." It is this: "Multiply the square of one-fifth of the girth by twice the length." He also says: "Multiply the square of the quarter-girth by the length, and the product will be the content, but not near the truth." Referring to these two rules, Hutton says: "The second rule is that which is commonly used, although it differs from the truth about $\frac{1}{5}$ of its content; but the first rule, which is a new one, is about 50 times nearer the truth than the other, it differing from the truth by only 1ft. in 190, and as it is full as easy in practice as the latter, it ought to be brought into general use by measurers of timber, who should certainly prefer the truth to such gross errors as are always introduced by the other method." It is over 150 years since this was written, yet some measurers of timber will still use the quarter-girth method for ascertaining its content; in fact, the "trade" knows of no other method, for timber merchants find it more profitable in every way to use it, as it pays to prefer "gross error" to truth. The absurdity of the quarter-girth, a common method of measuring, is exposed by Hutton in three "Problems," which he states in this way:—(1) To find where a piece of tapering timber must be cut, so that the two parts measured separately shall produce a greater solidity than when cut in any other part, and greater than the whole. (2) To find where a tree must be cut, so that the part next the greater end may measure to the most possible. (3) To cut a tree so as that the part next the greater end may measure to exactly the same quantity as the whole measures to. It is, therefore, possible, to cut off as much as one-third the length of a tapering tree trunk or branch without lessening the cubic content of that trunk; in other words, the content of the whole tree will measure no more than that of the greater part cut off, even though more than one-third of its length has been removed. In the "Young Measurer's Complete Guide," by D. Fenning, 1779, rules are given in a series of dialogues between "Philo, a master," and "Discipulus, a scholar." After Philo gives the correct method for finding the content of round timber, Discipulus observes: "I perceive there is no difficulty in finding the solidity of any piece of round timber, provided the dimensions are given; but I should be glad to know what method is taken by practical measurers to find the circumference." Philo: "The method is very easy, being nothing more than this:—They girth the piece round with a string, double the string twice, and measure it on a rule, by which means they obtain one quarter of the girth, which they consider as the side of a square whose area is equal to the area of the circular base." Discipulus: "But is this method true?" Philo: "No, it is very erroneous; for the fourth part of the circumference of a circle is not equal to the side of a square whose area is equal to the area of the circle." Discipulus: "Why, then, is it practised?" Philo: "It was first introduced by ignorance, and continued because it is somewhat easier than the other, till custom fixed it so firmly that all the demonstration in the world will not be able to banish it from general practice." Philo, however, misses the real reason, which is that under the incorrect method of measuring the merchant pays for 130c.ft. and gets 150c.ft. or more, and as the methods of measuring are practically under the control of the trade, it is not at all likely that purchasers will consent to have a correct content given, when one that is incorrect is profitable to them in every way. Bonycastle's "Mensuration," published in 1787, gives a rule similar to the last referred to by Hutton (given above) for the correct content, and he gives the quarter-girth method as being "according to common practice," showing at the same time by an example that this is

	A	B	C	D	E	F	G
GIRT-----	9'425	8'815	8'206	7'596	6'984	6'371	5'762
QUARTER GIRT	2'356	2'204	2'051	1'899	1'746	1'593	1'440
DIAMETER----	3'000	2'806	2'612	2'418	2'223	2'028	1'834
AREA-----	7'068	6'184	5'358	4'592	3'881	3'230	2'639



"exceedingly erroneous." The only rule given by Dalby in his "Course of Mathematics" (1807) for finding the content of tapering round timber is one for finding the true content—the same, in fact, as Rule 3 in the last article. Gregory revised Hutton's "Mensuration." In the 1829 edition he says of the quarter-girt method:—"This rule, which is commonly used, gives the answer about one-fourth less than the true quantity of the tree, or nearly what the quantity would be after the tree is hewed square in the usual way: so that it seems intended to make an allowance for the squaring of the tree." He points out that curious problems relating to the cutting of timber so as to produce uncommon effects, arise out of the adoption of quarter-girt measurement. These have already been given in referring to Hutton's "Mensuration" published in 1770. Quarter-girt measurement was attacked by Davidson in his "System of Practical Mathematics," published in Edinburgh (1831). After giving the rule he says: "It is obvious that this rule must be very inaccurate in the case of tapering timbers, and even in the case of timber which does not taper; notwithstanding its inaccuracy the rule is universally used in practice. It seems to have been introduced in order to compensate the purchaser of round timber for the waste occasioned by the squaring of it, which must generally be done before it is fit for use. Davies amended "Hutton's Mathematics" by Gregory, and in 1841 the twelfth edition of the book was published. Here the quarter-girt rule is given to find the solidity of round or unsquared timber, so that it has finally become an acknowledged method of finding the content of round timber, even by mathematicians. It is true an explanation is given which accounts for the deficiency in content by saying it is an allowance for squaring the tree. When the trunk of a tree is a frustum of a cone, having its bases parallel to each other, but unlike (they may be ellipses), then none of the rules already given will be applicable, and the following must be used:—To the longest diameter of the greater base add half the longest diameter of the lesser base, and multiply the sum by the shortest diameter of the greater base, and reserve the product. Then to the longest diameter of lesser base add half the longest diameter of the greater base, and multiply the sum by the shortest diameter of the lesser base, and add the product to the former reserved sum, and that sum will be the triple square of a mean diameter which, multiplied by .7854, and that product multiplied by a third part of the height, gives the solid content. The best living authority on timber measuring in this country is Mr. E. A. P. Burt, whose "Standard Timber Measures" every student, surveyor, and timber merchant should have by them for reference in all disputed cases of timber measurement. In the preface to the third edition of his book he says: "The simplicity of Hoppus's tables has enabled them to maintain their ground for more than a hundred years"; and he refers subsequently to the erroneous contents of round timber as given by Hoppus, comparing this measurement with what he calls "Custom House" measurement, which gives the true contents nearly. The outline of an imaginary log of tapering round timber is given in the accompanying sketch. To facilitate calculations, the girt, quarter-girt, diameter, and area at seven places are shown, these dimensions being all in feet and decimal parts of a foot. The lengths are in feet. The contents in feet are found as follows by Rule 1 (last

$$\frac{H}{3} (A + a + \sqrt{A \cdot a}) = \frac{30}{3} (7.068$$

$$+ 2.639 + \sqrt{7.068 \times 2.639}) = 10 (9.707 + 4.319) = 10 \times 14.026 = 140.26 \text{ cube feet. By Rule 2, } H \times .2618 (D^2 + d^2 + Dd) = 30 \times .2618 (3^2 +$$

$1.834^2 + 3 \times 1.834) = 7.854 (9 + 3.363556 + 3 \times 1.834) = 7.854 \times 17.865 = 140.32 \text{ cube feet. By Rule 3, } H \times .02652 (C^2 + c^2 + Cc) = 30 \times .02652 (9.425^2 + 5.762^2 + 9.425 \times 5.762) = .7956 (88.83 + 33.2 + 54.306) = .7956 \times 176.336 = 140.292. It will be seen from these calculations that the contents of the log are 140ft. 3½in. (the decimal parts of a foot vary from 26 to 32, because the decimals have been carried out to a greater extent in some calculations than in others). By these rules section X is found to contain 61'93ft., section Y 45'98ft., and section Z 32'38ft., in all 140ft. 3in. as before. According to Hoppus, section X contains 48ft. 9in. 2pts., section Y 35ft. 11in. 3pts., and section Z 25ft. 0in. 10pts., in all 109ft. 9in. 3pts.; but the singular thing is that the whole log, according to Hoppus, contains only 107ft. 9in. 10pts., or 2ft. less than the three logs of which it is composed, or about 32½ft. less than the true content. Burt's rule is to multiply the square of what he calls the "consistent" quarter-girt in inches, by the length in feet, and divide by 113; applied to the log sketched it works out in this way: consistent quarter-girt 1'899ft. = 22'788in., $22.788^2 = 519.29294$, this multiplied by 30 = 15578.7882, and divided by 113, gives 138'654ft. as the content, which is only 1½ft. under the true content. Hutton's approximate rule given above, the formula for which is$

$$\left(\frac{G}{5}\right)^2 2H = S \text{ (where } G \text{ is the girt) works out}$$

thus: $\left(\frac{7.596}{5}\right)^2 \times 2 \times 30 = 1.519^2 \times 2 \times 30 = 2.307361 \times 2 \times 30 = 138.441 \text{ cube feet, a result almost similar to that obtained by using the Burt 113 divisor. In measuring wainscot oak logs, the sides and crowns of which are straight, multiply the width by the mean depth (at the crown), and this by the length, 50ft. of this measurement is a load. In measuring the length, take up to quarters of feet, and the width and depth to quarters of an inch. The quotient must of course be divided by 114 to bring the contents to cubic feet. When the logs show irregular figures along the sides and humped crowns, as sketches in Articles XXXV., they must be measured in two or more sections, the exact number of which will be determined by the shape of each log. In measuring very irregular wainscot oak logs, the content obtained must necessarily be approximate only, the closeness of that approximation depending entirely on the skill of the measurer. Lathwood is measured by the fathom, a fathom being 6ft. by 6ft. by 6ft., or 216cu.ft. The purchaser should see that the pieces are closely packed; the vendor will, of course, see that they are packed as loosely as possible. A "frame" is usually built to measure lathwood, and a large quantity is described as being so many "frames" or cubic fathoms. The usual sectional forms of lathwood are shown in Article XXXVI. When mahogany logs are of irregular shape or "jagged," the whole length must be subdivided into as many separate parts as its form may demand; the content of the separate pieces added up to one gross sum will give the content of the whole. In measuring logs with defective angles—that is, such as are approximately octagonal, multiply the width by the depth in inches and subtract the square of the base of the defective angle, and multiply the remainder by the length in feet, dividing the product by 12, and 12 for the content in feet. The builder who wishes to find the number of St. Petersburg standards in any parcel of deals had better bring the deals into cubic feet, and divide by 165, the number of feet in a standard; when these areas of the deal-ends in inches are multiplied by the lengths of the deals in feet, divide by 11, 3, 5, 12, and 12. The whole system of correct timber measurement is based on theoretical mensuration; anyone acquainted with it can$

learn in a short time, and without any difficulty, its application in practice. Without a thorough knowledge of the mathematical foundation of the rules for obtaining the contents of surfaces and solids, no one need ever hope to become an expert and accurate timber measurer.

THE END.

PATTERN DESIGN.*

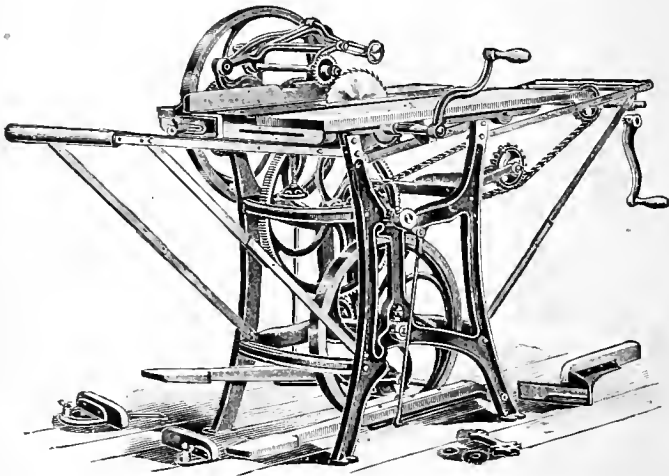
THE practical evolution of repeat in patterning ornament and the planning of decorative forms furnishes a wide and interesting subject for the graphic pen and pencil of Mr. Lewis F. Day, who ranks as one of the most capable and workmanlike ornamentalists of the day. He has, under the title of "Pattern Design," brought out a very attractive handbook for the decorator and student, which supersedes his previous volume, known as "The Anatomy of Patterns." Covering the same ground, and answering the same purpose, the new book is produced on the basis of the old one. Several of the illustrations we seem to remember; but the larger number of designs and diagrams are fresh, bringing the treatise up to date. The principles and the teaching are the same; but as the fashion in form changes, Mr. Day has included some of his later designs. The drawings throughout are excellent, and give as clear a notion of the subjects represented as can be done in black and white without colour. As a rule coloured illustrations in books on ornamental design are very unsatisfactory, and as the patterns have to be given to a reduced scale, the application of chromo-lithography is very misleading unless it is done in an exquisite and very costly way. Any book so produced is thus beyond the means of ordinary learners. We are not complaining, therefore, because colour is not attempted, but it occurs to us that some of the designs thus crisply delineated, as it were in silhouette, present a more harsh and liney effect than they actually would do, or in reality do when rendered in softened gradations, or, better still, in tender contrasts of colour. The chief purpose in view is, however, not so much to illustrate ornamental designs as to show how they are built up and constructed. In this process one of the chief considerations which should be kept in mind is not only the shape and curves of the ornament itself, but the shapes and proportions of the vacant spaces, which in a large number of instances assume more importance in the background than the foliations and forms on which so much ingenuity and time has been expended. In open metalwork design this is of more consequence still. We refer to the subject because in practice many forget its importance and fail accordingly. Mr. Day supplies a great variety of eminently practical advice, showing, too, how to set about producing a design. This is not to be accomplished by idly letting the pencil meander about on a sheet of paper, in the vague hope that something may come of it. To be practical, the designer starts with a notion of some definite sort—a happy thought, an image in his mind perhaps—or, if not that, the idea at least of the sort of thing he wants, the thought of certain lines or masses, or a combination of the two, which promise when repeated to make pattern. Geometric diapers in squares or other rectilinear forms or interlacing circles, diapers based upon scales, double diapers, straight-lined or curvilinear ones, produce almost endless varieties; zigzag lines and interlacing or counterchange arrangements display other developments, all of which come within Mr. Day's work. He also explains the "drop" repeat and the "false" drop, which seem so mysterious to

* Pattern Design. A Book for Students. By LEWIS F. DAY. London: B. T. Batsford. 7s. 6d. net.

the uninitiated. The unpractised in design assume that they have only to repeat at given intervals, no matter what study from nature, and make good the connection between the repetitions of it, and the trick is done. It is not quite so easy as that. Mr. Day shows how and why, thus helping to make the learner's essay as easy as possible by giving the reader the benefit of his own methods and experience. His work is connected with painted, woven, or flat ornament, such as in mosaics and pavings, rather than in architectural enrichment. In this way his work is good, and within the limitations he has adopted. Mr. Batsford, who is responsible for the issue, has spared no endeavour to supplement Mr. Day's care and thought, therefore the book does both author and publisher ample justice. It will be welcomed by many a fellow-worker, and cannot fail to be of much use to the student who is learning to design and draw well. There are nearly 300 illustrations in the volume.

A COMBINATION SAW.

A MACHINE which is in itself almost a complete workshop cannot but commend itself to carpenters, cabinet makers, and woodworkers generally. We have no hesitation, therefore, in directing the attention of readers to the Union No. 5 Combination Rip and Cross-Cut Saw and Attachments. This machine, which is shown in our illustration, has a strong and rigid iron frame,



cold rolled steel shafts, with hand-scraped Babbitt metal-lined boxes, adjustable to take up the wear. The combination wood and iron table-top is 28in. wide by 36in. long; the middle portion (10in. by 36in.) is of iron, planed perfectly true. The table is hinged at the back, and can be adjusted up or down by hand-screw in front for rabbeting, grooving, dadoing, &c. The self-feed ripping device is self-adjusting for all thicknesses of wood, is positive in its action, power being transmitted by gears. The self-feed has three changes of speed. This device is easily detached, leaving the table free for cross-cutting, &c. The extension rolls increase the length of the table to 7ft., making it valuable for cutting long stuff. They can be instantly folded down out of the way when not in use. It is provided with two hand powers, both arranged to allow the operator a natural, upright, and easy position. The hand power (for one or two cranks) at the rear of machine leaves an entirely free table for cross-cutting (any length), dadoing, &c., which we would consider an important feature. The foot power has a powerful walking motion. Power is transmitted entirely by automatic machine-cut gears and chain belts, doing away with slip or lost motion, and runs smoothly. It is claimed that with this machine one man can easily rip soft wood up to 3½in. thick, and hard wood to 2in., doing the work of four men with common handsaws, and that it is equally valuable for cross-cutting, mitring, &c.

The "Union" boring attachment can be adjusted to the machine as quickly as changing a saw. It has an adjustable sliding table and stop to gauge the depth of hole. The steel spindle has a socket for ½in. round straight-shank machine-bits. It is driven entirely by gears, and is powerful in its action.

The "Union" scroll-saw attachment can be quickly placed in position on the machine, making

a strong and serviceable scroll-saw with large capacity. It will cut up to 3in. thick, and swing 24in. It has adjustable saw-clamps, and the wooden arms are mounted on pivot rocker-plates.

The "Union" moulding attachment is designed for edge-moulding, beading, &c., on either straight, curved, or irregular work. The spindle has a vertical adjustment for different thicknesses of work, and is made to rotate in either direction to suit the grain of the wood.

Space prevents us from giving illustrations of the various attachments; but a complete description of the "Union" machine, which will be found valuable to every woodworker, will be found in Catalogue "A" of the Seneca Falls Manufacturing Co., 559, Water-street, Seneca Falls, N.Y., which also describes a complete line of foot, hand, and light power wood-working machinery.

IRISH BUILDING STONES.

DRIFT, GENERALLY.

THE great central plain of Ireland, which has a general level of from 100ft. to 300ft. above the sea, is everywhere bottomed by Carboniferous Limestone. A series of rocks found in England above this limestone, and which represent in time a lapse of several hundred million years, have, at present, no representatives here. Over the whole area of this plain is strewn a mass of drift con-

sisting of clay, in which are imbedded pebbles and boulders, and layers of sand and gravel in regular beds, stratified like the the older formations. This drift rises from the plains up the sides of the hills and mountains to a height of from 2,000ft. to 3,000ft. above the sea-level in many places. The materials of the drift are used for making bricks, mortar, and concrete. As they are not derived directly from any of the solid rocks of the older formations, a short notice of their origin, mode of occurrence, and the natural forces which produced them will be given here, as applying to the whole country generally, and in this way save special reference being made to them under the heading of each separate county. When builders see such materials lying in nearly horizontal and parallel layers in any clay or gravel pit, it seldom occurs to them that they were at one time solid rock, and that they were not "created" clays, sands, and gravels as they are now seen to be. Yet, that it is so is an undoubted fact, and the blocks from which they were derived have—everyone—been quarried, crushed, rolled, sifted, washed, and carried to where they are now found by moving ice and running water. Every particle of limestone, gravel, or sand formed at some time part of a solid bed of limestone rock; every grain of silicious sand was cemented to other grains in a mass of sandstone, and the finest clays were all derived from the waste of granite and other hard rocks. The magnitude of the work done by these natural agents in this pulverising and washing process may be judged from the fact that the well-known Curragh of Kildare, a small patch only of the plain, is a bed of limestone gravel 150ft. thick, derived from the destruction of solid strata which once occupied this same place. As carrying agents ice and water are unequalled. A block of limestone, 140 tons weight, was found in the Coal Measures of Killenalea; one 21ft. by

9ft. by 7ft. rests on Silurian strata near Money-fall at a height of 800ft. above the sea; and one found resting on Old Red Sandstone near Kenmare measured 26ft. by 16ft. by 15ft., and it consequently weighed over 470 tons. Other blocks are found scattered about the country in places where there are no limestone rocks *in situ*. All these have been carried for miles across the country and up the hillsides, and the work can only have been done by water transport. As the whole surface of Ireland, except the top of the highest mountains, was at one time covered with a thick deposit of Drift, and as there are several areas entirely free from it at present, an enormous quantity must have been removed since Ireland last rose from the sea, and this must have been effected by the brooks, streams, and rivers which have been running unceasingly since. A block of Leinster granite 27ft. by 15ft. by 11ft. was found in a field six miles from the nearest granite *in situ*, and on ground 620ft. above the sea; blocks of Galway granite are scattered over the counties of Clare and Limerick, and some are found as far south as Mallow in Cork, a distance of over 100 miles as the crow flies. The largest boulders and blocks are found lying on the drift, and not buried in it. So that ice must have floated them across the sea and dropped them on the drift which lay on the bottom. The largest local accumulation of drift found in Ireland commences at the foot of the hills near Millstreet, in Cork County; it completely covers all the solid rocks for a distance of 20 miles, reaching to Mangerton in Kerry. The whole of this deposit, which is from 100 to 300ft. thick, is a vast rubbish tip, the materials for it having been derived from the hills on the south and west sides. Blocks of granite are found scattered over the basalt of Antrim, and the Antrim hard chalk, with its accompanying flints, is found in the drift of Dublin and Wicklow, and as far south as Ballycotton Bay on the east coast of Cork. When all this work was done, and Ireland submerged, it is not possible to say in terms of A.D., but in geological time it was only yesterday.

Much gravel and sand are dug from Eskers; they are long embankments formed of the water-worn waste of limestone rocks which rise to heights varying from about 20ft. to 150ft. above the level of the surrounding country. The shape of these Eskers is very irregular, and they are of widely different areas in transverse section. The tops are rounded, and the sides sloping or precipitous, or sloping on one side and precipitous on the other. They are characteristic of the Great Central Plain, across which one of them extends for a distance of more than 100 miles, with a base width in section of 500 yards in some places. The Great Southern and Western Railway passes through an Esker a few miles north of Kildare, where the railway company has a ballast siding. The railway passes through the same Esker at the Arden Hills, in the King's County; both cuttings afford admirable sections of this natural embankment. All the Drift deposits described above may be classed as Glacial Boulder clay in two divisions, a Lower and Upper, separated by Inter-glacial beds of sand and gravel; marine, estuarine, lacustrine, and fluvial Drift, and meteoric or blown Drift. During the Glacial Period Ireland was covered with a huge ice sheet over 1,000ft. thick, whose longest flows on the land surface were towards the south-east, prominent centres of dispersion being in Fermanagh, Donegal, Galway, and Kerry, but none in the mountains of Dublin, Wicklow, or Wexford. The direction of the main ice flows is distinctly seen on the hard limestones of the central plain where they are cleared of drift, for here the surface of the rocks is polished, scratched, and striated by fragments of rocks held in the ice which moved slowly over it. The boulder clays, sands, and gravels were all formed by the agency of ice sheets which were forced over the dry land; the erratic blocks were thrown down from icebergs which floated over the land when it was submerged, though some of the smallest may have been moved by ocean currents. The true layers are built up with materials entirely different from those found in the Glacial Beds; they are of much more recent date, and were formed by cross-currents in an Esker sea, when the land was again submerged long after the Glacial Period had closed. In sinking foundations, getting out clay for bricks, digging sand or gravel, or breaking up erratic blocks, the builder will have some idea from the foregoing description, of the nature and

origin of the materials he is dealing with, and of their exact geological sequence.

In the northern counties of Tyrone, Fermanagh, and Cavan pit sand and gravel are obtained from gravel ridges called Eskers; but these are not of marine origin, like the Eskers of the central plain, which are due to conflicting tidal currents; they are evidently of glacial origin, for they are found at levels much above that of the Esker seas, and their contents also point to the same conclusion.

ANTRIM.

The rocks in this county are chalk with flints (275), Upper Greensand, Lower Lias, Rhaetic beds, Keuper marls and sandstones, conglomerates with gypsum, Permian beds, Lower Carboniferous shale with sandstones (279), coal seams and ironstone, Old Red sandstone and conglomerate, Lower Silurian altered rocks, Basalt (340), volcanic ash, and other Igneous rocks. Belfast is built on Alluvium and Keuper marl. Lisburn: Permian sandstone, Caradoc and Bala beds. Ballymoney: Basalt, Alluvium. Ballymena: Basalt. Larne: Lower Lias clay, Keuper marl, Upper greensand, Chalk, Basalt. The most recent rocks in this county—and they cover almost its entire surface—are solid Angitic lavas, which form the columnar basalt seen in the Giant's Causeway, Thane's Hill, near Larne, and along the north and north-east in many places. Denudation has removed a considerable portion of these rocks; but they still attain a maximum thickness of as much as 500ft. in some places. Basalt columns are usually found from 6in. to 18in. diameter, and in lengths of from 5ft. to 150ft. Joints are produced in rocks by the contraction of the masses during consolidation, and the prismatic joints which give rise to the columnar structure of basalt is common to greenstone and felsite; it has also been observed in the gypsum quarries of Montmartre, near Paris. If a block of basalt be melted, and allowed to cool slowly, it will return to its original stony condition; but the mass, instead of being homogeneous, will be found to have a columnar structure, the sides of the columns being hexagonal, and the "beds," flat, concave, or convex, according to the pressure on them. The columns in a mass of basalt are always at right angles to the surfaces of the mass, and in many basalt dykes the columns are separated in the middle, the beds of one set of columns resting on the joints of the opposite set. If basalt is melted and then cooled rapidly, it forms a coarse-looking glass which cannot be distinguished from "obsidian" or the volcanic glass of volcanic districts. The basalt of the Rowley Hills in Staffordshire has been melted in this way and cast into ornaments and mouldings for building purposes; but there is always a danger of such cast blocks weathering badly, on account of the numerous minute cracks which traverse the material in all directions. Underlying the columnar basalt in this county are beds of stratified volcanic ashes, with abundant remains of oak, pine, sequoia, and other trees. The presence of such beds between successive layers of volcanic lava proves incontestably that a lake must have existed here during some period of suspended volcanic activity, and on the bottom of this all these deposits were thrown down. Beds of iron ore, known locally as "bole," are commonly found accompanying the sedimentary deposits. This is a hydrated aluminium bisilicate, in which part of the alumina is replaced by ferrous oxide; it is, in fact, a poor, clayey ore. Limonite, known in the trade as "Belfast aluminous ore," is also found in lenticular bedded masses, on different horizons, in these volcanic rocks; this, and the other true ores are probably decomposition products of masses of trap rock. The sedimentary beds described rest on sheets of basalt and vesicular amygdaloidal trap, about 600ft. thick, the whole of which were erupted into the air from numerous craters scattered all over the county. The lowest series of volcanic rocks, and those which underlie the rocks just described, are the highly silicated and felspathic lavas which were poured out over a much-denuded and water-worn floor of chalk, or older rock where the chalk has been completely removed. There were three distinct periods of volcanic activity in this district, and the marked differences in the materials which form the successive beds of ejected matter, show that a considerable time must have elapsed between each active period. That the whole surface of the land which forms the present county of Antrim should at one time have been covered with molten rock is a startling statement;

yet it is undeniably true, and the exact geological time when this happened can be ascertained with tolerable certainty. It is not at present possible to convert geological time into ordinary time, and one million years are of as little account in geology as one million miles are in astronomy; hence the lava of Antrim was just as solid when the world was created, according to "Revelation," as it is at the present moment. It has been said that the first lava flow was over a floor of chalk; hence it is evident it must have occurred after that chalk was deposited on some sea-bottom, and subsequently upheaved as dry land. In many places an irregular bed of flint gravel, varying from a few inches to over 20ft. thick, is found between the basalt and the chalk, and as this gravel can only have been derived from chalk beds which originally existed here, a considerable lapse of time must be allowed for their removal by atmospheric and other influences. Consequently, the first volcanic outburst here must have taken place long after the deposition of the chalk formation. A key to the age of the basalts is found in the plant remains of the various interstratified leaf-beds, and these would seem to fix the time of the eruptions as later than the "London Clay," and therefore probably in the Miocene Period. If this is so, as there are no stratified rocks of this period in the British Isles, the Continental Miocene sandstones, shales, and limestones are represented here solely by the basalt of Antrim and the West of Scotland. The maximum thickness of all the lava-flows in this district is about 900ft., and the average thickness 545ft.; they cover an area of over 1,000 square miles. The principal basalt or whinstone quarries are: Whitehead, Belfast, Mr. C. W. Cooper (40 men); Whitewell, Belfast, Mr. W. Agnew (18 men); Smith's, Carnmoney Hill (5 men); Tardree, Mr. J. Coulter; Killybegh, Ballymena, Mr. S. Herbison; Glen Farm, Ligoniel, Mr. A. Clements; Drum, Ballymena, Mr. W. J. Meneely; Craighill, Ballyclare, Mr. H. Service; Deer Park, Glenarm, Mr. R. McAllister; Clougher, Bushmills, Arthur Brooks; Bank, Larne, Mr. H. Foster; and Aghalee, Lurgan, Mr. S. McKeon. The basalt is extensively used for road-metalling; the hard varieties are used for building, some of the quarries yielding good blocks of various sizes, which are easily hammered. The tabular, massive, and columnar rocks make good rubble walling, but the stone is usually difficult to work, and its very dark colour, almost black, makes it unsuitable for dressings, but it has sometimes been used for moulded work. A stone called "Tardree granite," which was obtained from a quarry five miles north of Antrim town, is found in nearly every public building in the county; it is "grey, granular, and durable," being really a granitic root of one of the great intrusive lava sheets of the district; it makes good sills, steps, quoins, and other dressings, and weathers well. There are tuffose rocks at Tardree, which look much like those that yield the well-known "Trass" of Germany, both being volcanic products. This trass was extensively used all over Europe and in the British Isles before the introduction of Portland cement, for converting ordinary lime into a hydraulic cement; the Tardree rocks have been tried in this way; but all attempts to convert any of the tuffs into hydraulic cement have hitherto failed. Slensish, Carrick-a-Rede, and Tardree were three important volcanic centres in this district; the Tardree volcano was probably one of the latest active volcanoes in Ireland, the lava from it having forced its way upwards through great thicknesses of overlying basalt. A trace of red elvan, found to the north of Cushendun cuts and polishes well, but the stone is much fractured and blocks of small size only can be obtained sound enough for building purposes. A very handsome bright red elvan is found north-east of Runabay. The columnar basalt of Aghnahot, Portglengone, was much used for building in quoins and copings, and for canal locks, weirs, and bridges, as much as 64,000 yards of rubble, and 78,500c.ft. of dressed stone having been worked in 1859; but this quarry does not now appear in any of the quarry lists of the country. The most recent stratified rock in the county is chalk, or "white limestone," as it is universally called here; it is always found underlying the basalt so fully described above, and chiefly around the edges of this great lava sheet quarries have been opened and are extensively worked to procure stone for making whitening, and for burning lime. This chalk is similar to the upper chalk of Norfolk and Kent

—that is, in its composition and age; but in texture it is wholly different, being hard, compact, and semi-crystalline, breaking with a conchoidal fracture. This change having been produced by the overlying basalts, the Antrim chalk is really a metamorphic rock, whilst the English chalk remains unchanged and as it were deposited as earthy, soft rock, without any tendency whatever to a crystalline structure. It is well known that if chalk, which is nearly pure calcium carbonate, be exposed to intense heat, it becomes decomposed, and parts with its carbon dioxide, the residue being ordinary quicklime; if, however, it is heated under such conditions that its carbon dioxide cannot pass off, the rock will not be decomposed, and when cooled it will be found unaltered chemically, though its texture will be completely changed, being no longer soft and earthy, but hard and crystalline. This is exactly what happened to the Antrim chalk. The successive sheets of molten basalt, which were poured out over it, supplied the heat necessary for calcining and converting the soft rock into lime; but the same covering effectually prevented the escape of any carbon dioxide. Hence the whole of the chalk here has been altered to a hard white limestone, altogether unlike the chalk as originally deposited, though its chemical composition remains unaltered. Owing to extensive erosion, the thickness of the chalk varies considerably; but in some places it is probably about 300ft. The white limestone is full of irregular cracks, and it cannot therefore be obtained in large sound blocks, neither is it suitable for dressings, though it can be, however, dressed and used for rough walling. One of the ablest geologists in Ireland, Professor Kinahan, remarked that "a house built of white limestone with quoins and dressings of black basalt has a clear but quaint appearance," which is certainly true; and he might have added that the contrast of walling and dressings would be startling—one being pure white, and the other almost black! The nearest approach to any work of this kind in England is to be seen at Selborne, in Hampshire, where a house in the square by the church is walled with a white chalky sandstone, the dressings being of red brick. But here the contrast, not being at all violent, is rather pleasing than otherwise, though the general effect is "quaint." The chief quarries in the white limestone are Criggan, Carnlough (145 men), Ballyvaddy, Carnlough (54 men), Fallow Vee (28 men), all worked by the Carnlough Lime Co., Ltd. Wee Park (7 men), Parisha (37 men), Demesne (14 men) Town (29 men), all worked by the Eglinton Limestone Co., Ltd.; Whitehead, Belfast, Mr. C. Cooper (40 men); Magheramorne, Mr. J. Adrian (60 men); Colin Well, Ballycolin, Mr. J. McQuillan (32 men); Whitewell, Belfast, Mr. W. Agnew (18 men); Kilwaghter, Mr. H. Baillie (23 men); Kileoan, Island Magee, Island Magee Limestone Co. (14 men); Rathlin Island, Rathlin Limestone Co. (20 men); Gleno, Larne, Messrs. Crawford (12 men). There are several other quarries, but they give employment to only 10 men and under. Lias beds are seen below the white limestone from the south of Colin Glen to White Head on the north side of the entrance to Belfast Lough. They are also found on the east coast of Island Magee, at Larne, Glenarm, Ballintoy, White Park Bay, and Portrush. At the latter place the Lias rocks are altered into hornstone where they are associated with volcanic rocks known as "Elvans." The Upper Greensand only is found in Antrim, where it forms the lower beds of the Cretaceous rocks, no representative of the walden beds. Lower greensand or Gault of England have been discovered in Ireland. Here the Upper Greensand is like the English rock, a soft, sandy chalk of greenish colour, the latter being due to the presence of small grains of silicate of iron. At Larne, where the rock is well exposed, the colour is red, but the prevailing colours are light and dark green. At Collin Glen, and at Waterloo near Larne, the greensand is from 10 to 20ft. thick; it does not furnish any building stone. The Lias rocks of Antrim afford no building stones. The clays may have furnished the material out of which the rude pottery was made which is found in the kitchen middens on the north coast. Rhaetic or Penarth beds are seen in Collin Glen, south-west of Belfast, where, as in England, they appear to be passage beds between New Red Sandstones and the Lias; their greatest thickness here is about 19ft., and they consist of dark coloured shales and limestones resting on shale clays and thin sandstones. Good sections of the rocks can

be seen along the coast near Larne, Glenarm, and Garron Point, where they are over 100ft. thick; they yield no building stones. Upper Bunter Sandstone, Lower Keuper Sandstone, and Keuper Marls form a long strip of Triassic rocks in the Lagan Valley. There is a continuous exposure of similar strata along the coast from Belfast to Ballycastle; in fact the beds generally are found encircling the great basaltic plateau, and in the lower grounds of river valleys, the outcrop being more in the nature of narrow bands than any great area of surface exposure. Near Carrickfergus the beds contain rocksalt, some of them being 88ft. thick, 95 per cent. of the rock being pure salt. Here the Lower Keuper Sandstones underlie the Salt Measures, and the thickness of the whole series of Triassic beds is estimated to be not less than 2,000ft. Gypsum has been found in the Keuper Marls of the Forth, Woodburn, and Lagan valleys; but none of the veins are thick enough to pay for working. The workmen call the New Red Sandstone of the north of Ireland "Red Free," and it may be said of it that even the best stone is very friable, and if it works freely it also weathers freely, so that although Belfast is built on the rock it imports its building sandstones from the adjoining county of Down, from Dumfries in Scotland, and from England. The "Red Free" changes colour on being exposed to the weather for a time, and it is therefore in this respect very unreliable. There are unimportant quarries at Red Bay, Bank Head, Newhaven, and along the Lagan Valley. The red marls of the Keuper division have been cut through by the railway from Carrickfergus to Larne, where they may be seen banded with irregular beds of gypsum. The Permian sandstones and magnesia limestones of England are represented in Ulster by a small exposure of brownish yellow magnesia limestone, which is seen resting as on red marls east of Cultra Pier, on the south shore of Belfast Lough, and in the Lagan valley, south-east of Moira, similar beds are found; but they yield no building stones anywhere in Ireland, and were formerly quarried solely for conversion into Epsom salts. Permian beds have not been identified with certainty in Antrim; but it must be recollected they are intimately connected with the Triassic rocks, and are only to be distinguished from them by their fossils. Lower Carboniferous rocks are worked in the Ballycastle coalfield for coals and sandstones. Though commonly called "Coal Measures," the strata really are a portion only of the Calp division of the Lower Carboniferous Limestone. The Calp of Ulster is similar to the English Coal Measures, but the rocks are on totally different geological horizons, and should not be confounded together. The principal quarry in the sandstones of the Ballycastle coalfield is that at Ballyvoy, and it is a celebrated one, or, rather, it was at one time celebrated, for at present the proprietor (Mr. H. M. McGildowney) works it with only three men. The quarry produces stone of two colours—pink and cream; a coarse-grained variety of the latter is strong and well suited for bridges, piers, and other weight-carrying work. It has been extensively used in the county; the Glendun Viaduct, where this stone has been built into all the more-exposed parts for dressings, shows no signs of decay. It is said that the finer stone can be edge-bedded without risk of failure; it works to a sharp arris, and is well suited for fine work. Other places in which this stone has been successfully used are Dover Hill, Londonderry, facings and dressings, 1785; spire of the Charitable Institute, Belfast, 1774; the portico of St. George's Church, Belfast, which was removed to this building from Lord Bristol's Palace at Ballyscullin. It was formerly used for tombstones, but Scotch and English sandstones have displaced it, though they are not anything like as good weather stones. One of the weaknesses of the Irish character is that anything brought from England or Scotland is much preferred to what is produced in Ireland, though the latter may be better suited in every way for the purpose in hand; hence Irishmen will persist in neglecting first-class building stones which may be quarried at their own doors, and import comparatively worthless soft stone from across the seas. Like almost every other building stone, that from the Ballyvoy quarry needs selection, for some of the fine-ground varieties are friable, whilst others are irregular in texture and iron spotted. The Old Red Sandstone is included with the Lower Carboniferous rocks of Ireland by Professor Kinahan, because in no place in Ireland

has it a defined upper boundary, the sandstones graduating into the Carboniferous beds. The Silurian sandstones and conglomerates of Cushendun have been quarried at Cavehouse for building in Belfast. The conglomerates can be raised in blocks suitable for heavy work, the finer sandstones being suitable for dressings. Though formerly much worked, these beds are now wholly neglected. Metamorphic rocks of Ordovician or Arenig Age occupy a considerable tract in the Ballycastle coalfield; but as they are hard grit and quartzite, none of them are suitable for dressed work, though they make good walling. Lime made from the white limestone of Antrim usually sells for 15s. per ton. The stone in its raw state is worth about 3s. 6d. per ton. The basalt is shipped to England. Crushed for macadam, it is worth 5s. 6d. on board vessels in Ireland, and about 10s. per ton in England. There are no less than 755 quarries shown on the Ordnance Maps of this county. At present only 58 are in work which exceed 20ft. in depth; this brings them under Government inspection.

BOOKS RECEIVED.

Saint Albans: the Cathedral and See. (London: George Bell and Sons). The latest volume in this excellent series of cathedral handbooks is a history of the Benedictine abbey church, since 1877 known as a cathedral, of St. Albans, by the Rev. THOMAS PERKINS, of Turnworth, who is also the author of the companion volumes on Manchester, Wimborne, Bath, Rouen, and Amiens. The reader naturally turns at once to see what view the writer takes of Lord Grimthorpe's reconstructions and new work; and general concurrence may be expressed in the tone of the criticisms. The new west front, although mildly described as "not altogether satisfactory" and "as good as most 19th-century work," is pronounced to be greatly superior in design to the work of the great Parliamentary counsel and clockmaker in the south and north transepts, where the feeble attempts at original treatment are justly condemned. Passing on to describe the highly-interesting older work, the length of the ritual nave, the flatness of the roofs, the fine vertical proportions of the elevations, and the massiveness of the arcades are pointed out in the western limb. The works of restoration carried out for Lord Grimthorpe in the Lady-chapel, and for Lord Aldenham (by Mr. Harry Hems) in the high altar screen, are spoken of with unqualified approval. The handbook will be found invaluable by those visiting or reading up the history of St. Albans, and is illustrated by fifty reproductions of photographs, some showing the condition of the building prior to the rebuildings of a quarter of a century since.

The formal reopening of the Lichfield Corn Exchange took place last week. The Exchange was founded and maintained for many years by a company, but some time ago it was acquired by the Corporation at a cost of £1,050. Some £300 additional has been spent on improvements and repairs.

The question of the erection of a new orphanage, which has been before the Primitive Methodist Connexion for some years, is approaching a practical settlement. The special committee intrusted by the Conference with the matter has had under consideration 41 sites recommended by the respective district authorities, and has decided in favour of one at Harrogate containing nearly eleven acres. The general committee at its last meeting approved of the site recommended, and authorised its purchase for £5,500.

In the case of the application for an order of discharge from bankruptcy made on behalf of Joseph William Elliott (described in the receiving order as Joseph N. Elliott), lately Bush Hill Park, Enfield, now Beddington, Surrey, builder, lately trading with John Hyne as Elliott and Hyne, the discharge has been suspended for two years, ending Sept. 14, 1905. In that on behalf of William Maxwell Gordon, Liverpool, timber merchant, discharge is to be suspended until a dividend of not less than 10s. in the pound has been paid.

It has been decided to erect a South African war memorial in Morrab Gardens, Penzance, and sketches have been prepared by Mr. Oliver Caldwell, F.R.I.B.A.

Good progress is being made with the extension of the county lunatic asylum at Bracebridge, near Lincoln, which will cost about £90,000. The contractors are Messrs. W. Brown and Sons, who have already received over £31,000 on account of the contract.

OBITUARY.

WE regret to hear that Mr. JAMES MARTIN BROOKS, A.R.I.B.A., of Orchard Cottage, Ashford, Middlesex, and 35, Wellington-street, Strand, eldest son of the late James Brooks, died on Saturday at his residence, aged 50 years. Mr. Brooks, who joined the R.I.B.A. as an Associate in 1881, has only survived his father, the well-known ecclesiastical architect and Royal Gold Medallist, by just two years. Mr. Martin Brooks was articled to his father, and joined him in partnership in 1886, Mr. G. H. Godsell being admitted as a member of the firm in July, 1901, and Mr. Groome at a more recent date. Among recent works carried out by the firm are the chapel at Tenbridge School, the churches of St. Peter, Hornsey, and St. Luke, Enfield. Mr. Brooks has left a widow and three children. The funeral took place at Ashford parish church on Tuesday afternoon.

MR. ERNEST BENNETT SINCLAIR SHEPHERD, M.A., who only a few months ago obtained an appointment on the Archaeological Survey Department of India, and late of Warwick-square, Kensington, died at Simla on Thursday, the 22nd inst., at the early age of 31 years. He was the elder son of the late Rev. F. Shepherd, and had practised as an architect, having been for several years a member of the London Architectural Association. He had for several years rendered valued help as president of an architectural and archaeological section at Morley College, and also of a similar club at the Borough Polytechnic, and frequently lectured on Medieval monuments and costumes, and kindred topics.

ALL lovers of old silver plate will regret the death of Mr. WILFRED JOSEPH CRIPPS, C.B., F.S.A., which occurred on Monday at Cirencester, at the age of 62. His chief publications were "Old English Plate" (1878), "Old French Plate" (1880), and "Corporation and College Plate" (1881). The result of the issue of these works, based on the researches of older collectors, including the late Octavius Morgan and the late Sir Augustus Franks, was to stimulate an interest in the ancient silver in the possession of churches and public bodies throughout the country, and to raise to an unexpected extent all well authenticated pieces of plate that came into the market. The great value of Mr. Cripps's books is that they form an authoritative guide to dates, places, and makers. Mr. Cripps was created a C.B. in 1889.

CHIPS.

There has just been erected in the parish church, Cortachy, N.B., a tablet of white Sicilian marble to the memory of the late Earl of Airlie, who fell at the head of his regiment, the 12th Royal Lancers, at Diamond Hill, South Africa, on June 11, 1900. An inscription to this effect is placed on the tablet.

The work of the Archbishop of Canterbury in his former diocese of Winchester is to be commemorated by the addition of his portrait to those of his predecessors which are hung in Farnham Castle. The subscription list having now been closed, the executive committee have commissioned Mr. Arthur Cope, A.R.A., to paint the portrait.

A new church of St. Peter, Wilfracombe, is approaching completion, and will be consecrated before the end of the year. It is being built at a cost of £6,000, from plans by Mr. G. H. Fellowes Prynne, F.R.I.B.A., of London. At some future date a tower is to be added.

Colonel Legard, of Welham Hall, is having a stained-glass window placed in the new church of St. Peter, Norton, Malton, in memory of the local men who went out to the Boer war. The window is to be shortly unveiled by the Bishop of Hull.

Mr. Ashton Bremner, of Oswestry, has been elected borough electrical engineer to the Burslem Town Council.

The Local Government Board have given their sanction to the application of the Seisdon Rural District Council for authority to borrow £14,000 to meet the expenditure involved in carrying out a system of sewage disposal for the township of Upper Penn. The site of the proposed works will be at Merry Hill, where the council has purchased 23 acres of land for £1,131. The sewage will be treated on the gravitation system, with septic tanks and continuous filters.

The foundation-stone of a new church was laid on Saturday afternoon in Timbercroft-lane, Plumstead. It is called the "Church of the Ascension." The architect is Mr. A. E. Habershon, and the builders are Messrs. Dorey and Co., of Brentford. The cost of the present section will be £2,500.

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ILLUSTRATIONS.

BLACKPOOL TECHNICAL SCHOOL.—FIRST PREMIATED DESIGN FOR TRAMWAY OFFICES, LIVERPOOL.—ST. ANDREW'S CHURCH, MUSWELL HILL.—A COUNTRY HOUSE.—MARYHILL LIBRARY, GLASGOW.—COTTAGES AT COOKHAM.—WOOD BRIDGE AT LUCERNE.—TRIUMPHAL ARCH AT VICENZA.—ATTRIBUTED TO PALLADIO.

Our Illustrations.

BLACKPOOL TECHNICAL SCHOOL: SELECTED DESIGN.

MESSRS. POTTS, SON, AND HENNINGS' design, which we illustrate to-day, was awarded the first premium in the recent competition held at Blackpool for this building. The plans and elevations explain the scheme, which is marked by a clock tower. It is to be built in brick and stone, but we have no detailed particulars from the architects other than those furnished by the drawings themselves.

LIVERPOOL TRAMWAY OFFICES: FIRST PREMIATED DESIGN.

This design, submitted by Messrs. Stones and Stones, architects, of Liverpool and Blackburn, was awarded the first premium in a recent open competition in accordance with the report of Sir William Emerson, past President of the Royal Institute of British Architects, the professional assessor appointed by the Liverpool City Council. The requirements of the corporation have changed since the competition was instituted, and consequently the scheme will not be carried out as at first intended.

ST. ANDREW'S CHURCH, ALEXANDRA PARK, MUSWELL HILL, N.

The church consists of nave, 91ft. by 27ft., north and south aisles, 12ft. wide, with gabled transepts, chancel, 40ft. by 25ft., morning chapel, 39ft. by 15ft. 3in., organ chamber and vestries, and a baptistery recess at west-end of nave. The arcades and arches generally are formed of moulded red bricks, with red Corsehill stone pillars, bases, and caps. The windows are of Bath stone, with splayed or moulded red brick jambs and arches. The walls are faced outside and inside with red bricks, relieved by Bath-stone bands and moulded brick string-courses. The roofs of nave and chancel are to be of arched form, divided by purlins and ribs into panels, and supported by curved and moulded principals, all of pitch-pine, with stone shafts and corbels to carry same, and covered with red tiles. The floors under seats are to be paved with wood blocks, the passages and chancel and eastern part of chapel with marble mosaic. Accommodation will be provided for 800 persons at a cost of about £8,000. The architect is Mr. J. S. Alder, of Arundel-street, Strand, W.C. The work is being carried out by Messrs. John Thompson and Co., builders, of Peterborough.

A COUNTRY HOUSE.

The house is to be built in South Bedfordshire. The plan has been arranged so as to get as much sunlight as possible into the principal rooms, and so that the hall can be used for billiards. Externally the bricks are local hand-made red bricks used in conjunction with hand-made tiles. The upper parts of the walls are covered with white plaster roughly swept on. Iron casements

with broad leads are used in the windows. The view given to-day was shown at the Royal Academy this year. Mr. Oswald P. Milne, of Chancery-lane, is the architect.

MARYHILL DISTRICT LIBRARY, GLASGOW.

WE illustrate to-day another of the three libraries which were won by Mr. J. R. Rhind, architect, Inverness, in December last. Mr. Horatio K. Bromhead, F.R.I.B.A., President of the Glasgow Institute of Architects, was referee in the competition. Estimates have been received which amount to about £6,000, the sum allowed, and the work is going on. It will be interesting to mention that Dr. Andrew Carnegie gave £100,000 to Glasgow to build libraries; about half this sum has been expended, so that there is still £50,000 further to be spent in libraries in Glasgow. Mr. Rhind has been further successful this year in winning two more Glasgow libraries—viz., one for Dennistoun and one for Bridgeton district.

COTTAGES AT COOKHAM.

THESE cottages were erected on the estate known as The Berries, Cookham-on-Thames, which was solely intended for private residences, so, although designed for the use of servants upon an estate in the vicinity, the buildings were required to be of such a character that they would not cause any detriment to the value of the surrounding houses. All available space has been utilised in the roofs, which supply a fourth bedroom and spacious storage cupboards. The walls up to the first floor level are built hollow, and the ground floor is raised well above the level of the highest known flood. Up to the first floor local red brick facings were used, with roughcast and tile hanging above; the roofs are covered with sand-faced tiles. The cottages were erected by Mr. George Lacey, of Cookham. The architects are Messrs. Edward Hyde and Son. The drawing given to-day was shown at the Royal Academy this year.

BRIDGE AT LUCERNE.

THE Spruer-Brücke, or Mühler-Brücke, as it is sometimes called, is one of the two covered bridges crossing the river Reuss at Lucerne. It was erected in the 16th century, and is decorated inside by illustrations of the "Dance Macabre." These paintings were at one time supposed to have been painted by Holbein; but are now known to be considerably later. The small building corbelled out from the pier in the centre of the bridge is a small chapel dedicated to the Virgin. The view was taken from the Arsenal. These drawings are by Mr. Edward L. Gaunt, A.R.I.B.A., of Bradford.

TRIUMPHAL ARCH AT VICENZA.

THE Triumphal Arch at Vicenza lies at the foot of the long flight of steps leading to the Pilgrimage Church on Monte Berico, about one mile from the town. It was at one time attributed to Palladio, and is built after his style. It is now known, however, to be of later date, and was probably erected some fifty years after his death.

The fine church tower of Happingburgh, on the east Norfolk Coast, and which rises to a height of 112ft., has recently shown ominous cracks and fissures, and is about to be restored in accordance with a report prepared by Mr. A. J. Lacey, architect, of Norwich. The contractors are Messrs. John Batchelor and Sons, of Stalham.

The building of the new tower of Beckenham parish church is nearing completion; the bells have been recast and are now about to be rehung. Formerly they were six in number, the oldest bearing the date of 1624; but they have now been increased to eight. The bells and the new tower will be dedicated by the Archbishop of Canterbury on Saturday, Nov. 14.

The Baptist chapel in Abingdon-street, Blackpool, has been acquired for £10,000, by H.M. Office of Works, for conversion into a post-office.

The Church of the Ascension at Malvern has just been erected by Messrs. Stephens and Bastow, of Bristol, from the designs of Mr. W. J. Tapper, of London. The building consists of nave and choir, without aisles, seats 300 people, and has cost £10,000.

The new Cambridge and County School for Boys was opened on Saturday by Lord Avebury. The freehold and buildings have cost £10,200.

After a long delay, the construction of the new Wilmslow - to - Levenshulme line of railway has actually been commenced at Wilmslow.

COMPETITIONS.

ENFIELD.—Early in the year some ten architects were invited to compete for a new church for 600 worshippers, at a cost of £12,000, to be built at Bush Hill Park, Enfield. Designs were sent in on July 1. The committee has not yet announced its decision. The designs will be exhibited in the Estate Office, immediately opposite Bush Hill Park Station, G.E.R., this afternoon and to-morrow (Saturday) up to 4 p.m.

SWANSEA.—At a meeting of the Swansea Town Council it was decided to award Mr. Glendinning Moxham, architect, Swansea, the premium of 10gs. for the best set of plans for artisan houses. Sixty-three sets of designs were sent in.

TAMWORTH.—At the last meeting of the town council the General Purposes Committee reported that 266 applications for particulars of the competition for the proposed Carnegie Free Library had been received, the first premium for which was £20, the second £10, and the third £5. Mr. J. A. Cossins, Colmore-row, Birmingham, was appointed architectural assessor at a fee of twenty guineas. It was decided to apply to the Local Government Board for sanction to appropriate a portion of the vacant land on the north side of Corporation-street for the erection of the library.

CHIPS.

A new Methodist Church, built at Killylea, County Armagh, was opened for worship last week. Mr. Gilchrist was the architect, and the contractors were Messrs. Bright Brothers, of Portadown.

The Bristol Sanitary Committee received on Friday the report of the city engineer, in which he stated that he estimated the cost of the construction of the new road from Coronation-road to the south end of the swing bridge (work H in accordance with the Act of 1897) at £16,338, and the cost of constructing the new road from the north end of the swing bridge to the south side of Cumberland Basin, also in accordance with the Act, at £1,400. The report was adopted, and the city engineer was instructed to proceed with the preparation of drawings.

On Wednesday week, at Holy Saviour's Church, Hatherston, the Bishop of Shrewsbury dedicated a number of gifts which had been made to the church, including a carved reredos and altar and handsome sanctuary curtains.

At St. Andrew's Church, Newcastle-on-Tyne, a memorial chancel screen was dedicated on Sunday by the bishop of the diocese. The screen is 11ft. 2in. wide by 12ft. 6in. high, and is made of Austrian oak. It has been designed by Mr. W. Ellison Fenwick, of the firm of Dunn, Hanson, and Fenwick, architects, of Eldon-square.

A new Roman Catholic church at Clydebank was opened for public worship on Sunday. The new church is situated on the Glasgow-road, is Early English in style, and is faced with red sandstone. The architects were Messrs. Pugin and Pugin, of Westminster.

Walter Stiff, Emma Stiff (or Flood), and Emma Mary Flood were remanded on Monday at Bow-street Police-court, on a charge of conspiring to obtain £6,039 from the London County Council by fraudulent means. The male prisoner carried on a business as wax modeller in Goswell-road, and his premises were acquired by the County Council. He sent in a claim to the Council for over £7,247, and in the arbitration proceedings was awarded £1,208 only. It was now alleged that Stiff supported his claim by false and fraudulent books, showing the amount of his supposed turnover.

On Saturday the memorial erected at Low Fell to perpetuate the memory of five men who died in South Africa during the late war was unveiled. The work was carried out by Messrs. Morrison and McBean, monumental sculptors, Gateshead.

Mr. T. Taliesin Ræes, architect, of Birkenhead, has resigned his seat on the town council of that borough, as he is completing for that body the supervision of school buildings planned by him for the late school board, the duties of which have been taken over by the Corporation.

A Local Government Board inquiry has been held at Ashwell, Herts, into the application to borrow £5,038 for purposes of waterworks and sewerage and sewage disposal works, according to the schemes prepared by Messrs. Elliott and Brown, of Nottingham.

The Glanadda Schools, Bangor, North Wales, are being warmed and ventilated by means of Shorland's patent Manchester stoves and grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

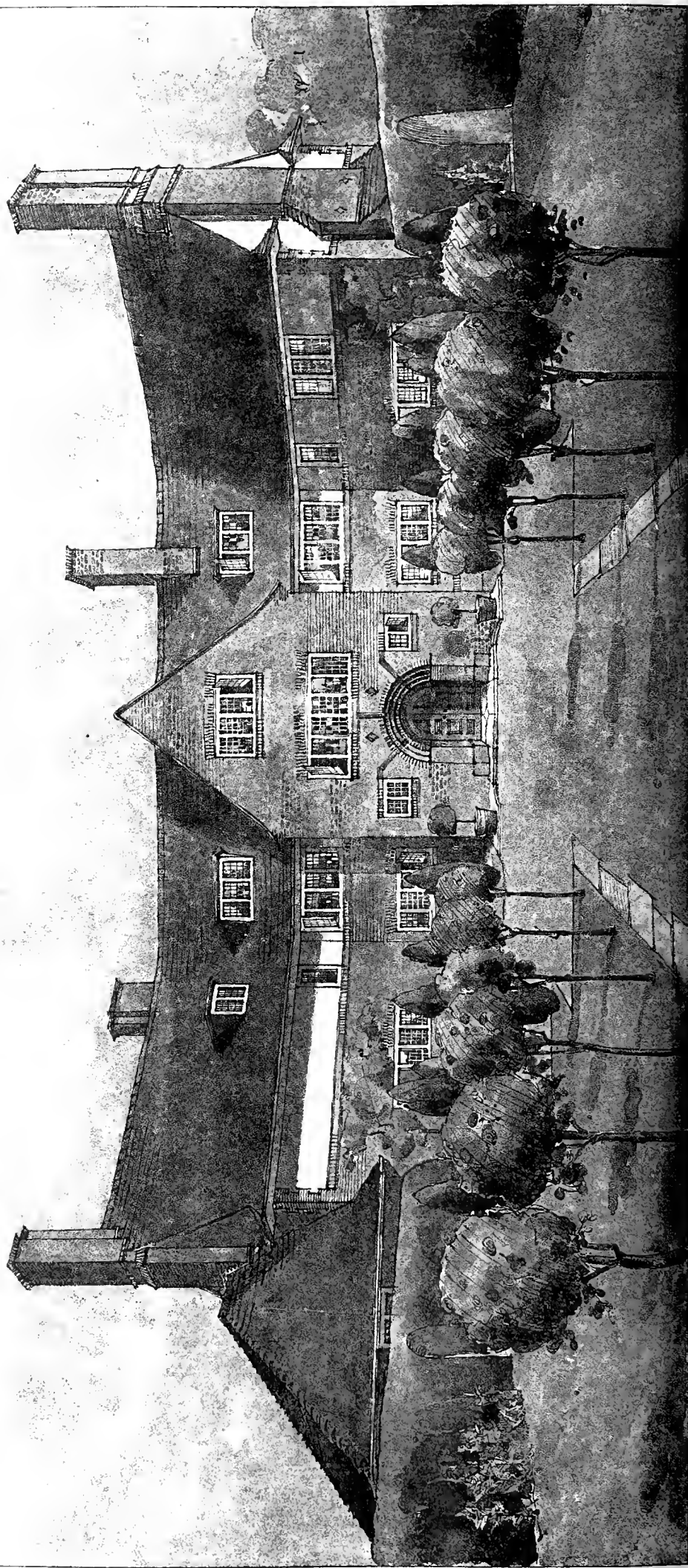
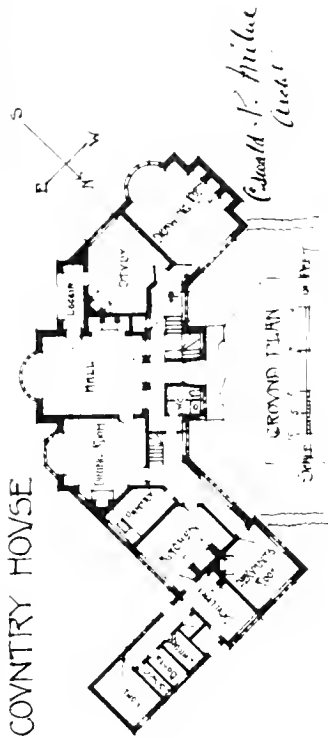
The parish church of Killyman was reopened last week, after repairs and redecoration, carried out by Messrs. Kimmett, builders, of Armagh.



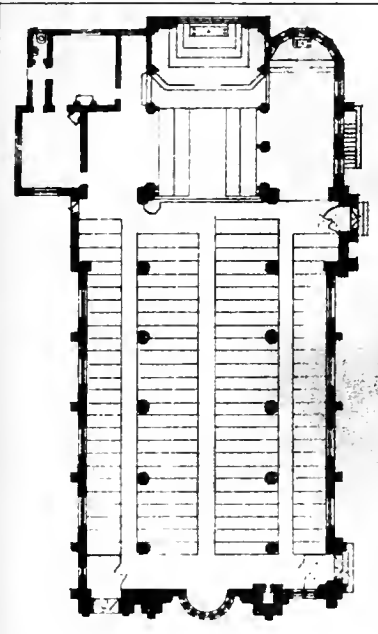
TRIUMPHAL ARCH AT VICENZA (Attributed to Palladio).

[Drawn by EDWARD L. GAUNT.]

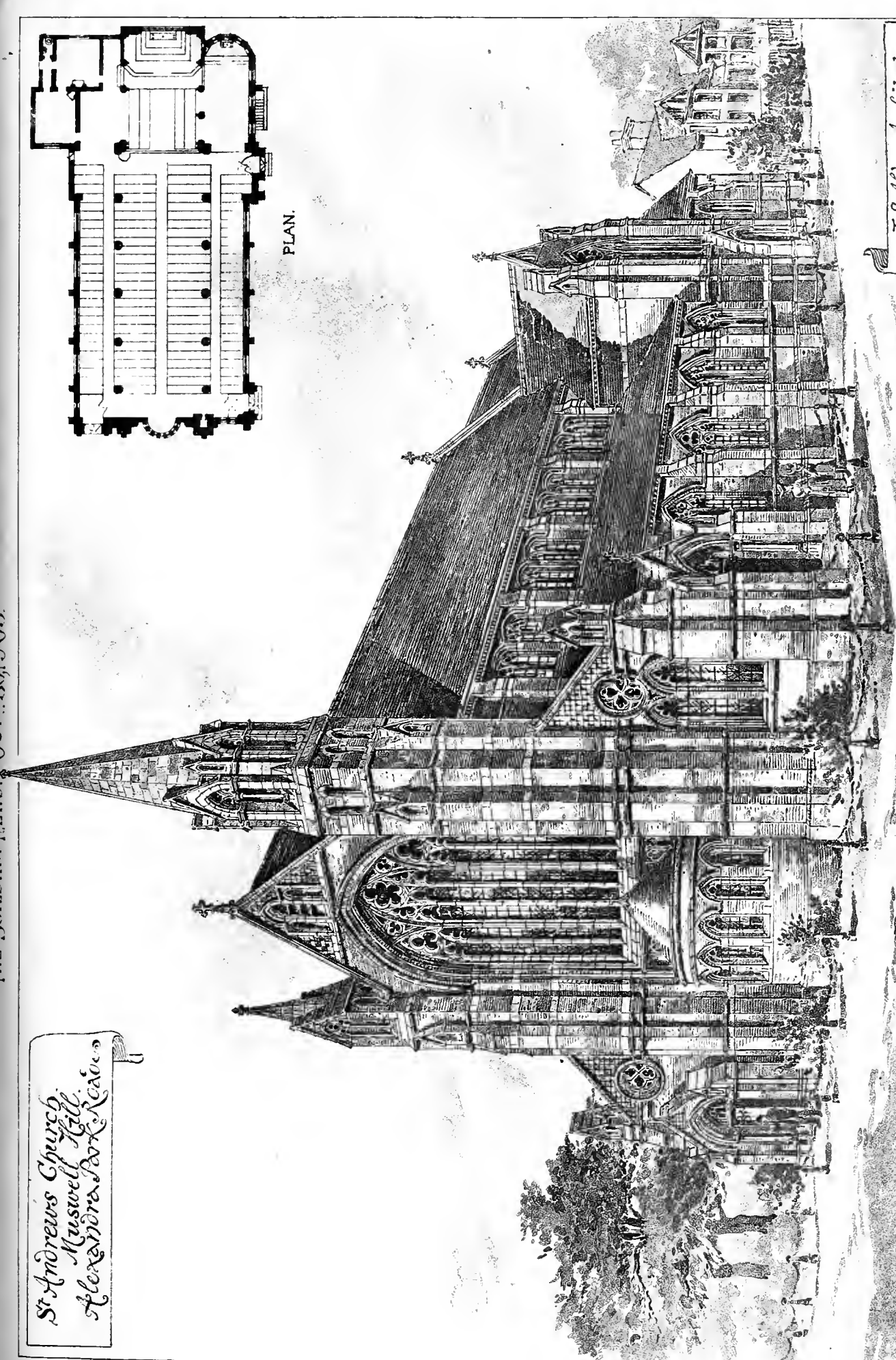
A COUNTRY HOUSE



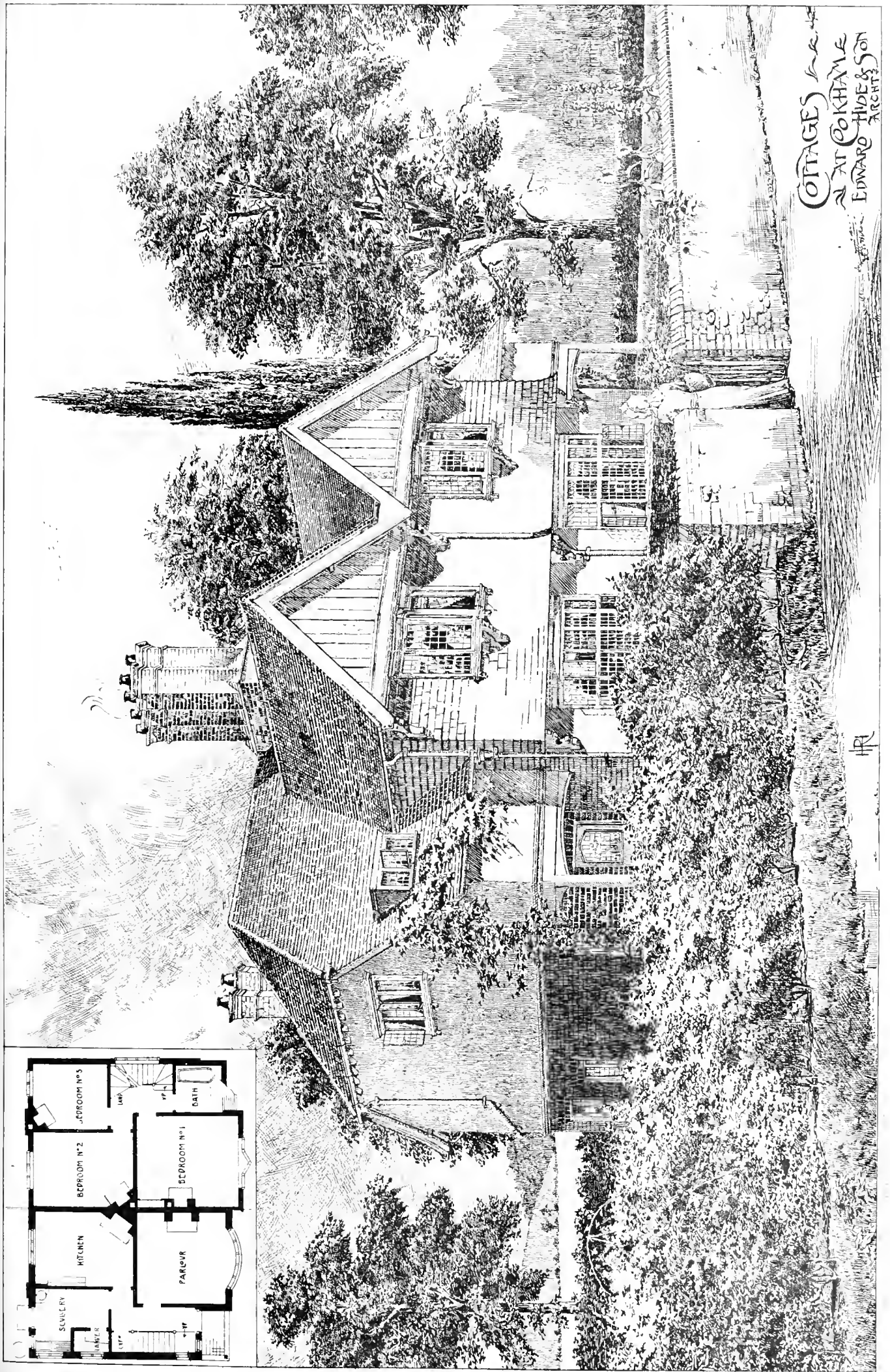
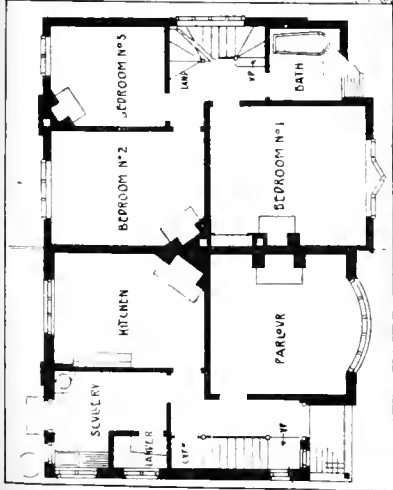
*St Andrews Church,
Muswell Hill,
Alexanders Park Road.*



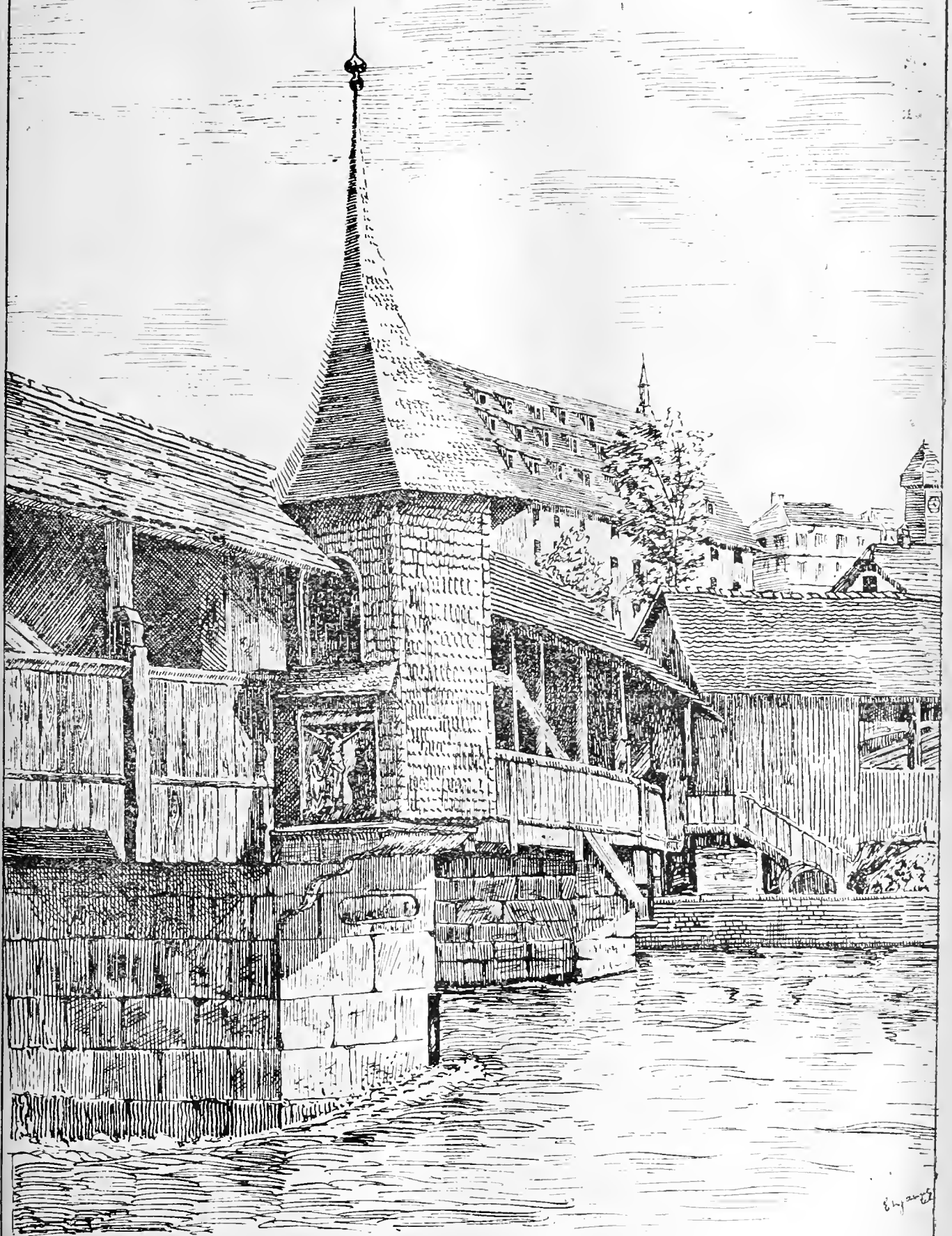
PLAN.



*J. S. Alder Architect,
1, Argyll Street Strand.*



COTTAGE
AT COCKHAM
EDWARD HIDE & SON
ARCHTS



WOOD BRIDGE. LUCERNE.

[Drawn by EDWARD L. GAUNT.]

Building Intelligence.

Barry Docks.—The foundation-stone of the new church of St. Mary, Holton-road, Barry Docks, was held on Wednesday in last week. The church consists of a nave and chancel 138ft. long, with side chapel, large organ-chamber, and vestries. When completed the church will seat about 1,000 adults, and the estimated total cost is £10,000. The tower will rise above the organ-chamber to the height of 113ft. The style is 15th-century English Gothic, and the design which is now being carried out was exhibited at the Royal Academy in 1901. The contract is being carried out by Mr. J. Cadwallader, of Cardiff, under the direction of Mr. G. E. Halliday, F.R.I.B.A., of Cardiff, Mr. R. Bennett being the clerk of works.

Blackheath and Charlton Cottage Hospital.—For the benefit of out-patients, a new dispensary, with medical consultation rooms, waiting rooms, &c., are being added to this hospital, which is in the Shooter's Hill-road, Blackheath, S.E. The addition will be, like the hospital itself, of red brick, with half-timbered gables and Broseley roofing tiles. The builders are Messrs. Garrett, of Balham Hill. The architect is Mr. Edward R. Robson, F.S.A., of Westminster.

Chatham.—Lord Roberts attended the consecration of the parish church at Chatham on Wednesday. Five churches are known to have been built on the site—a Saxon church, a Norman church built probably about 1200 A.D., the 14th-century church, which was destroyed by fire in 1786, the 18th-century church, and the present church, which has been built at a cost of upwards of £16,000, and on which there remains a debt of about £2,500. The new building has been carried out from designs by the late Sir Arthur W. Blomfield. In the tower, which was erected as a memorial of the Diamond Jubilee of the late Queen Victoria, is a fine Norman doorway, while let into the wall is a marble slab upon which is carved the figure of the Greek deity Euphrosyne. The goddess is seated upon a stool, and the head is gone, but the name is cut in Greek characters upon the marble. The slab was found imbedded in the Norman wall of the chapel which once stood where the south-west entrance is to-day. Immediately on the right of the Norman entrance is a Norman staircase, which was discovered when the west end of the 18th-century church was removed. The majority of the Norman remains are in the new baptistry designed by Mr. Charles Blomfield.

Dundee.—The annual report of Dundee University College, just issued, states that the adjacent grounds of Ellenbank have been purchased at a cost of £11,500 for the extension of the college, and plans for reconstructing the buildings have been prepared by Sir R. Rowand Anderson, LL.D., of Edinburgh, which have received the approval of the council and the teaching staff. It is proposed that the present frontage should be entirely replaced by a new structure almost co-extensive in length with it and standing 20ft. in advance. The total cost is estimated at about £30,000. A beginning will be made at the western end, where the present conditions are the most unsatisfactory, and the work carried out in three sections, each of which may be separately undertaken when means are available. A large addition to the separate department of chemistry will provide a new general laboratory for junior students, and will thus relieve the recent overcrowding. The estimated cost of the work is £2,500.

Edinburgh.—A special sub-committee of the Edinburgh Town Council, appointed to make arrangements for proceeding with the construction of the Usher Hall, has met, Sir James Steel, Bart., presiding. The sub-committee, after consideration, agreed to recommend that the council should exercise its powers of compulsory purchase to almost their full extent. The area, which is rectangular in form, and about 4,500 square yards in extent, includes not only the Synod Hall, but the lunc in the rear and certain property beyond it, including a few outhouses belonging to Lothian-road Public School. It was decided that it would not be necessary to buy the school itself. A house and studio on the other side of the school will be required for the purpose of affording better access. Discussion took place also as to whether the plans should be prepared by the city works department, or whether com-

petitive plans from independent architects should be invited. In the end the sub-committee unanimously agreed to recommend to the parent committee that the work should be intrusted to Mr. Morham, the city superintendent of works, and his staff. This report has been adopted by the committee.

Kensington Gore.—The church of the Holy Trinity was consecrated by the Bishop of London on Wednesday. The church, which is built of stone, externally and internally, is intended to hold about 800 people. In character it is an English treatment of 14th-century work. Eventually the fabric will comprise a wide nave, with a single aisle on the south side and a double aisle on the north, and spacious vestries. At present the nave, chancel, and the south aisle only are built, and the arches of the nave on the north side are temporarily blocked up with brickwork. The high arched roof is supported on slender columns. The wide roof of the nave is continuous, unbroken by a chancel arch, and it is intended to separate the chancel from the nave by a high but open screen of oak. The roof is treated with red ornamentation on a white ground. The building has been designed to occupy the whole of the available space, and when completed the breadth of the nave and the aisles will be 76ft. The architect is Mr. G. F. Bodley, R.A., and Messrs. Stephens and Bastow, of Bristol, are the builders. Much of the church furniture is still lacking.

Larne.—The cottage hospital in Victoria-road, built at the cost of Sir Hugh H. Smiley, Bart., has been opened this week. The building has a frontage of 140ft., and the central block has a depth of over 80ft. All the outside walls are built hollow, the lower portion being faced with Belfast red perforated bricks, and the upper portion pebble-dashed, with the gables in half-timber work. The roofs are covered with red Staffordshire tiles. The central block contains the administration department. The wards for male and female patients, each of which accommodates six adults, are situated on each side of the central block, and at the extreme ends of the building are day-rooms, which, in case of emergency, will each accommodate four additional beds. In connection with each ward, but cut off by corridors opening to the outer air, are bath-rooms, w.c.'s, &c. In the rear is the operating-room. On the first floor of the central block are three private wards and five bedrooms for nurses and servants, with two sets of baths, for patients and staff. In the rear of the building are a washhouse and laundry. Mr. James Ferris, of Larne, was the contractor. The parquet and terrazzo floors were by Mr. J. F. Ebner, of London. The work has been carried out from the designs and under the supervision of Mr. N. FitzSimons, A.R.I.B.A., of Belfast, with Mr. William Harpur as clerk of works.

Leeds.—The new hospital for women and children, which will be opened by Lady Mountgarret to-day (Friday), forms an extension of the old residence hitherto used. The new buildings, which have been designed by Messrs. Chorley, Connon, and Chorley, architects, Leeds, adjoin the old premises, and provide accommodation for an out-patients' department, a general hospital with accommodation for 48 beds, and also for a maternity department with four beds. The out-patients' department is in a semi-detached building independent of the general hospital, and contains an out-patients' hall, with registry-office, and isolation, dressing, consulting, operative, and examination rooms, as well as a dispensary. The general hospital provides for a hall, board-room, and secretary's office, and accommodation for the medical staff. On two floors there are two large wards with twenty beds each, two wards for three beds, and two single wards; together with kitchens, bath, and other rooms. There is a maternity department, with a lying-in ward and three smaller wards, with kitchens; whilst provision is made for a mortuary, with autopsy room and laboratory attached. The old hospital will henceforth be devoted to administrative purposes, and for the accommodation of the nursing and general staff. All the walls and ceilings of the patients' rooms are lined with granite silicon and plaster, and painted with ripolin. The floors are laid with terrazzo, with all the angles throughout the building rounded off. The drains are laid on concrete platforms, so as to avoid the risk of settlement, and all lines of pipes carried out in straight lines from manhole to manhole, so that

any pipe may be taken up or stopped without disturbing the surface soil. Provision has also been made for warming all incoming air, if necessary, whilst it is sought to avoid draughts by means of double windows. The cost of the buildings, which are of brick with terracotta dressings, will be about £20,000.

London County Council.—At Tuesday's meeting of this body the Parliamentary Committee were requested to advise in what form legislation might best be promoted next session for securing that the gardens in squares and similar plots of land in London should not be built upon, but preserved for ever as open spaces. A request from the City Corporation for a contribution from the Council towards the cost of widening from 40ft. to 50ft. the new street proposed to be formed across the site of Christ's Hospital was refused. Replying to various questions, Captain Hemphill said the Building Act Committee had power, where they thought proper, to refuse the plans for one-story shops. It was unfortunate that the Building Act Amendment Bill of last session was not properly understood, for there were provisions in it for safe-guarding such shops, and he hoped, when the matter was brought forward again, it would receive strong public support. It was announced that the electric tramways from the bridges to New Cross would be opened by the first week in January. Mr. John Alfred Gill Knight, A.R.I.B.A., of Godliman-street, E.C., was appointed district surveyor for South Fulham.

New London Fire Stations.—Mr. E. Smith, the chairman of the fire brigade committee of the London County Council, on Saturday afternoon opened a sub-fire station at Vauxhall. The station occupies a commanding position on the Albert Embankment, at a point near Vauxhall Cross, the Council having utilised for the site a piece of surplus land which remained over after the completion last year of the widening of the roadway on its southern side. The site is about 6,000 superficial feet in area, and its value (£2,835) has been charged to the fire brigade capital account. The station, which is lighted by electricity, has been erected by the Works Department of the Council, the estimate for the work being £8,400. The accommodation comprises an appliance room with front and back entrances, and with stables opening direct into it; watch and recreation-rooms; and accommodation for the staff of the station, consisting of one officer, five firemen, and a coachman.—Mr. Smith also opened on Saturday afternoon another new fire-station at Pageant's Wharf, Rotherhithe-street. The station is situated between the Surrey Commercial Docks and the river, and about a mile and a half from the old fire-station at Gomm-road, which originally served it. The new building has a frontage on the Thames of 92ft., and 84ft. to the street. The site cost £3,280. The station has accommodation for a station officer, six firemen, and a coachman, and possesses a reading-room and recreation-room.

Salford.—The church of St. Ignatius, which was consecrated by the Bishop of Manchester on Thursday in last week, has been built by Earl Egerton, of Tatton, in a new district. The site is a part of the ground originally belonging to the Tatton estate, occupied for many years by the Infantry Barracks, and sold by the War Office to the Salford Corporation, from whom it was purchased. It fronts Oxford-street, leading into Regent-road. The new church is about the same size as that built recently by Lord Egerton at Ordsal, and will seat 500 persons. Earl Egerton decided to adopt the round-arched Romanesque style. The material is brick, with terracotta dressings, and the nave columns are of mottled red Runcorn stone. The church has been built from the designs and under the superintendence of the architects, Messrs. Darbyshire and Smith, of Manchester. Its cost, with the furniture, is about £9,500.

The Bishop of Lichfield dedicated on Saturday last a new chancel to St. Peter's Church, Priors Leic Shropshire. The church, built a little over six years ago, consisted of plain brick nave, with tower. A new chancel of stock brick, with stone dressings has now been added at a cost of about £450.

Mr. W. A. Ducat, an inspector from the Local Government Board, held an inquiry at the Guild hall, Walsall, on Tuesday, with respect to an application by the town council for sanction to borrow £1,000 to defray the cost of purchasing land at the Pleck for a recreation ground and allotment

PROFESSIONAL AND TRADE SOCIETIES.

THE SOCIETY OF ARCHITECTS' QUALIFYING EXAMINATION.—At the recent examination to qualify for membership in the Society of Architects, one of the candidates, Mr. W. D. Jenkins, of 12, Frederick-road, Sparkhill, Birmingham, was successful in qualifying for a Special Certificate of Honours and the Gold Medal of the Society. Mr. Jenkins is the first to have attained this distinction, to obtain which it is necessary for the candidate to have passed in every subject of each section at one examination, and to have secured at least 80 per cent. of the obligatory marks.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—In anticipation of the opening meeting of the session 1903-4 of the Royal Institute of British Architects on Monday evening next, by a presidential address from Mr. Aston Webb, R.A., the new R.I.B.A. *Calendar* has just been published. It shows a further increase in bulk from 360 to 376 pages. The total membership is now 1,878, consisting of 640 Fellows, 16 Retired Fellows, 1,110 Associates, 8 Honorary Fellows, 41 Honorary Associates, and 63 Hon. Corresponding members. Last year the aggregate was 1,816, made up of 617 Fellows, 16 Retired Fellows, 1,069 Associates, 8 Honorary Fellows, 44 Honorary Associates, and 62 Hon. Corresponding members. The number of students has increased from 451 to 507. The following is the syllabus for the ensuing session:—

- Nov. 2.—1. President's Opening Address.
- Nov. 16.—2. "Le Trésor de Caude et les Monuments de l'Art Ionien à Delphes." By Monsieur J. T. Homolle.
- Nov. 30.—3. Business Meeting.
- Dec. 14.—4. "The Royal Victoria Hospital, Belfast: Its Inception, Design, and Equipment." By Messrs. Wm. Henman and Henry Lea, C.E.
- Jan. 4, 1904.—5. Business Meeting.
- Jan. 18.—6. Award of Prizes and Studentships. Paper: "Architecture in Lead." By Mr. J. Starkie Gardner.
- Feb. 1.—7. President's Address to Students. Presentation of Prizes.
- Feb. 15.—8. "The Bacteriological Disposal of Sewage from Isolated Buildings," by Professor Frank Clowes, D.Sc.
- Feb. 29.—9. Business Meeting: Election of Royal Gold Medalist.
- March 14.—10. "Plaster Decoration," by Mr. J. D. Crace.
- March 28.—11. "Electric Generating Stations," by Mr. C. Stanley Peach.
- April 18.—12. "The Statues of Wells Front, with Some Contemporary Foreign Examples of Sculpture," by Mr. E. S. Prior.
- May 2.—13. Annual General Meeting.
- May 16.—14. "The Planning of Collegiate Buildings," by the Rev. J. B. Lock, M.A., Bursar of Gonville and Caius Coll., Camb.
- June 6.—15. Business Meeting: Annual Elections.
- June 20.—16. Presentation of the Royal Gold Medal.

CHIPS.

Mr. George Scott, of Bank Buildings, Bothwell, N.B., and of Messrs. Scott and Rae, pavement and cement merchants, who died on April 6th last, has left personal estate valued at £26,705 6s. 8d., including £9,353 in the business of his firm.

Greenhill new school, Coatbridge, was formally opened on Friday by the late chairman of the Old Monkland School Board. The school has a frontage of 240ft., and will accommodate 750 pupils. The cost is estimated at £3,670.

Mr. Frank Windsor, architect, of Croydon, has been selected by the committee of the St. Augustine's parochial hall, Croydon, to carry out the work. Accommodation for about 450 persons is to be provided, with the usual offices.

At a county meeting held at St. Albans on Monday, convened by the Earl of Clarendon as Lord Lieutenant of Hertfordshire, it was decided to perpetuate the memory of the late Marquess of Salisbury and his connection with the county by the erection of a statue at Hatfield and the founding of a Science Scholarship to enable a student from any secondary school in the county to join any university in the world.

The Duchess of Albany laid, on Monday, the memorial-stone of the new Royal Waterloo Hospital, in the Waterloo Bridge-road. The new building, which is being erected from designs by Messrs. Waring and Nicholson, of Parliament-street, S.W., and is now being roofed in, was illustrated in our issue of July 17 last by a double-page perspective. For the section now in progress, at a cost of about £10,000, Messrs. Holliday and Greenwood are the contractors.

The Bishop of Winchester on Saturday consecrated the new church of St. George at Badshot Lea, a growing district situated between Aldershot and Farnham. The church, which is built of concrete and flints, with Bath-stone dressings, affords accommodation for 258 sittings, and has been erected at a cost of about £2,860.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LIII., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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* * * Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

EDGAR J. SCARFE.—Inquire of B. T. Batsford, 94, High Holborn, W.C. He stocks books on all the subjects you name, and frequently at second-hand prices.

"BUILDING NEWS" DESIGNING CLUB.

SECOND LIST OF SUBJECTS.

B.—A Solicitor's Country House in stone, with stone slated roof, on a level site, surrounded by trees. The reception-rooms should face the south and south-east, with the principal entrance on the N.W. side of the house. The gardens are on the south side, below a terraced lawn. The accommodation is to be mainly on the ground and first floors, two servants' bedrooms and a bedroom on the second floor. No objection would be taken to a belvedere, lead-covered turret and flat; but this feature is optional. The dining-room is to be 25ft. by 15ft., exclusive of a bay, if any is provided; drawing-room is to be 18ft. by 15ft., and the library about 15ft. by 12ft., located conveniently for use as a business room. There must be a good roomy panelled entrance hall, say 10ft. square, with a 4ft. wide oak staircase beyond the hall and out of sight of the entrance to the house. The kitchen offices to be of a suitable kind, including a butler's pantry and housekeeper's little room fitted with store cupboards so placed as to be available for the use of the mistress also. A cloakroom and w.c. are required on the ground floor for gentlemen. Five bedrooms on the first floor, a w.c., h.m.c., and a bathroom. The cost of the house to be reckoned at 91. per foot cube to limit of £2,200. A cycle-house is not wanted, as a motor-house and stable will be built detached from the house, and need not be shown. Windows to be mullioned and lead glazed. The style based upon Tudor or Jacobean work is to be adapted to modern requirements in a simple and broad way with gables. The ground-floor rooms to be 9ft. 10in.

high, and the first-floor rooms 9ft. high. Scales to be 8ft. to the inch; two elevations, one section, and three plans. Drawings to reach the BUILDING NEWS Office not later than Nov. 30.

J. F., London.—(We can see no advantage in two competitors collaborating in submitting designs. In over twenty-one years' experience of the working of our Club, we have found the individuality of the contributors one of its leading merits, and think students should rely upon their own efforts.)

DRAWINGS RECEIVED.—"Young Michael," "Puck," "Quill," "Eagle," "An Old Scholar," "Zigzag," "Marcus," "Gwen," "Yew Tree," "Lyric," "Tudor," "Frena," "Sandy," "Adze," "Eurymedon," "St. Nicholas," "Cleddadyn," "White Heather," "Novocastria," "Sunny Jim," "Chin Chin," "Four-Point-Seven," and "Iuca."

Correspondence.

ST. GEORGE'S PLACE, KNIGHTSBRIDGE.

To the Editor of the BUILDING NEWS.

SIR,—My attention having been drawn to the illustration and article in your valuable journal of Aug. 28, describing the new buildings erected by the tenants on the freehold of the Ecclesiastical Commissioners in Knightsbridge, I feel sure you will permit me on behalf of those tenants to reply to what is evidently an *ex parte* and inspired notice of one of their officials, but, at the same time, an incorrect version.

Mention is made of the fact that friction has arisen with that "human equation," the tenants, some of whom have raised unnecessary difficulties, which have been only overcome by the insistence of the freeholders, whilst, it is said, "in some cases everything has worked most easily and satisfactorily." It is neither correct nor true to say that the difficulties have been overcome, or that in some cases *everything* has worked satisfactorily and most easily. The whole of the tenants have, either personally or through their architects and solicitors, strenuously resisted the unheard-of and unprecedented pretensions of the architect, who, not content with having a free hand (which he has used unsparingly in erecting these ornate and costly edifices at the expense of the tenants, and to which they have submitted) desires to dictate and impose upon them shop-fronts totally unsuited for their trades, thereby interfering with their just and legitimate rights to trade in a manner deemed by them, as practical men, the most attractive and remunerative, and so enable them to compete on equal terms with their fellow traders. To impose such conditions would be a restraint to trade of an insufferable character, more worthy of the feudal ages than of the 20th century.

The tenants do not believe the Commissioners themselves know of the extraordinary conditions sought to be effected by their official. A memorial has, therefore, been drawn up and signed by practically the whole body of tenants and building lessees, and it has been my duty to present it, not only formally to the Commission, but to send to every commissioner a copy, and we await the result of the memorial with every confidence, feeling assured that such a broad-minded body will carefully weigh the case brought to their notice, and render that consideration and justice for which they have hitherto been renowned to a loyal body of tenants, amongst whom are several firms of the highest standing representing important industries, whose names are household words in the commercial world. One and all deplore the friction which has been caused by the want of tact on the part of a doubtless well-meaning official, but one who, for the sake of a scheme or idea, and for architectural effect, would sacrifice the well-being and success of a large body of tenants, who have executed the work as specified, and who now desire to be allowed for the 79 years of the lease to enjoy the fruits of their capital and labour without undue restraint and interference.

At the abortive sale of the L.C.C. sites in Kingsway and Aldwych last week, the conditions were nothing like so onerous as those sought to be imposed by the architect at Knightsbridge, and yet they were scouted by a large body of representative men as being so unreasonable as not to be worthy of consideration or a bid.

It must not be forgotten the Knightsbridge land was a commercial site upon which commercial buildings were built by commercial men, and not, as stated in your article, with the object of securing monumental results—I presume to the architect.—I am, &c.,

J. J. CRIDLAN, Hon. Sec.

14, Bishop's-road, W., Oct. 22.

Intercommunication.

QUESTIONS.

[12018.]-**Certificate.**—In the event of an architect certifying for a larger amount than is due to a contractor during the progress of the works, what is the client's remedy?—**DOUTFUL.**

REPLIES.

[12013.]-**Old Coffins.**—Without a doubt, at very early periods in our country's history, coffins cut out of solid blocks of oak were used. An instance occurred not long ago, during some underpinning at the ancient church of St. Michael and All Angels in Brinkworth, near Chippenham, where, it was reported, near its porch were found some coffins cut out of solid oak butts, each laid due north and south. Considerably above them 11th century remains appear to have been discovered, suggesting that the wooden coffins dated from a still earlier period.—**HARRY HEMS.**

[12015.]-**Stove.**—We notice in your issue of Oct. 23, p. 566, under the heading of "Intercommunication," that a hot-water arrangement heated by gas is referred to. Probably this is our gas "Speedon" radiator, as illustrated in pamphlet herewith. We can recommend this radiator in every way, as it is both economical and efficient.—**THE COALBROOKDALE CO., LTD., Coalbrookdale, Shropshire.**

[12016.]-**Draughts.**—Your suggestions are not new, I think. Fancy grates have been made by many in London and provinces for warming air first and diffusing it through house, or by radiators. Inspection of the Building Exhibitions at Agricultural Hall at Islington, perhaps at Sanitary Museum, Mortimer-street, one or two of the museums at South Kensington, building journals weekly. Abridgments specifications stocked at Patent Office go to testify. Hood and Dye on "Warming Buildings" worth looking at.—**REGENT'S PARK.**

[12017.]-**Small Building.**—(1) Longman's "Notes" give corrugated sheet-iron as under, Birmingham wire gauge:—

No.	Thickness.	Weight per sq. in.	Width futes.
16	0.051 in.	880 lb.	5 in.
17	0.056	320	5 in.
18	0.049	280	5 in.
19	0.042	252	5 in.
20	0.035	224	5 in.
21	0.032	205	5 in.
22	0.020	195	5 in.
23	0.025	165	5 in.
24	0.022	150	5 in.
26	0.020	112	5 in.

(2), (3), and (4) See Laxton's Prices Book, on Timber Tables, cubical contents in floors, partitions. (5) Question of cartage, is it not, if old bricks are easily removed and sound? (6) Measure up quantities for chimney, and price it about so much per rod. If you multiply prime cost of bricks delivered by 5, it gives the value per rod, to which add price of lime and mortar. With all stocks it may be £17 to £18 per rod, or 30s. 4d. to 32s. 4d. per cubic yard. Concrete in foundations per foot cube from 10s. 3d. to 15s. (7) Pack the sashes in crates, and doors can be packed together with straw as protective if you fear damage in transit.—**REGENT'S PARK.**

In a letter to the *Times* Mr. Somers Clarke, F.S.A., draws attention to the discreditable and almost incredible condition in which the roads surrounding the Albert Hall still remain. Although that hall was opened nearly thirty years ago, Mr. Somers Clarke says that the thoroughfares inclosing and giving access to it are still neither properly made nor lighted, nor do they appear to be under the supervision and watching of the police.

An adjudication in bankruptcy is announced in the case of Harry Daniel Earl Earl, architect, of Worthing.

The Amersham Board of Guardians have instructed Mr. Belch, architect, Chesham, to prepare plans for a proposed new infirmary at the work-house, in accordance with the requirements of the L.G.B.

Princess Louise visited Croydon on Tuesday to unveil a memorial statue of Queen Victoria. The statue, the fund for which was raised by public subscription, has been erected on a site facing the town-hall and municipal buildings. It is the work of Mr. E. F. Williamson, of Esher, and represents Queen Victoria seated, wearing her crown and State robes, and the right hand holding the sceptre. The cost has been nearly £1,000.

The Duke of Norfolk is chairman of an influential committee which has been formed for the purpose of erecting a monument in Westminster Cathedral to the memory of the late Cardinal Vaughan.

Mr. Henry Wilson, J.P., timber merchant, South Shields, died on Sunday at his residence in Weston village, aged 84 years.

New premises, which have been built by the New Delaval and Newsham Workmen's Club, at Newsham, were opened on Saturday. The building is of red bricks, with stone facings, and has been erected by Mr. William Redford, contractor, from plans prepared by Mr. John Goulding, architect, Blyth. The contract price amounted to £2,030.

The parish church of Portsmouth is undergoing restoration, under the direction of Mr. T. G. Jackson, R.A.

ARCHÆOLOGICAL.

DUNFERMLINE ABBEY.—An interesting discovery has been made in Dunfermline Abbey. As workmen were employed last week removing part of the rough rubble-work, which filled a doorway in the south wall of the church, they disclosed a finely ornamented doorway of Norman architecture of the period and style of the ancient church. The arch of this doorway, which is 9 ft. higher than the floor of the church, is richly ornamented on the outer face and the inside of the vault with elaborate chevron or zigzag mouldings, similar in character to the Norman arcade work on the inside of the walls of the church. The Norman capitals are enriched with raised floriated scrollwork, and show the only examples of that kind of ornamentation in the church. The sides and lower parts of the doorway have been much mutilated, though the double capitals of those on each side are in good condition. Evidently at a later date than the formation of the Norman doorway a long flat stone had been laid across resting on the side capitals and forming underneath a shallow chamber or recess. This was found to be filled up with partly loose stones, among which, as in the space above, were a number of fine specimens of mouldings and of carved work. The abbey has been visited by Mr. W. Wybrow Robertson, architect for Scotland to H.M. Board of Works, who has stopped the preparations that were being made for the erection on the site of a South African War Memorial, which will now be erected elsewhere in the building.

CHIPS.

Ex-Bailie Robertson, of Leith, died at his residence, 1, Hawthornbank-terrace, Leith, on Monday. Mr. Robertson was born at Blair Atholl in 1830. He went to Leith in 1844, and ultimately entered and carried on successfully for over twenty years the business of carting contractor and builder. He was the "Father" of the town council.

Mr. J. H. Hughes, of Huddersfield, has been appointed resident engineer for the construction of the new reservoir in the Rhondda.

At Monday's meeting of the Edinburgh and Leith Gas Commissioners, it was reported that, in recognition of the services of Mr. Herring in connection with the erection of the new gas works at Granton, and the economies resulting therefrom and otherwise, a committee had resolved that his salary should be advanced to £1,500 on the understanding that he would undertake to continue as the commissioners' engineer for at least five years from that date. The report was adopted.

The War Memorial at Tynemouth, unveiled by the Hon. W. Brodrick last Friday, was designed by Mr. A. B. Plummer, F.R.I.B.A., of Newcastle.

The Marquess of Zetland opened on Tuesday the new east block of the Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. The present extension, which cost £16,000, in addition to providing accommodation for forty-five patients, also contains service and staff rooms. In order that patients may have the benefit of as much fresh air as possible, the south-west front has been constructed on the gallery principle. Only twenty-five of the forty-five beds now provided will be opened at present, as £10,000 is still needed to defray the cost of the extension and furnishing.

Archbishop Bourne opened on Sunday the new Roman Catholic Church which has been erected in Upper Kennington-lane, S.E. The building has cost about £9,000.

The Birmingham Corporation entered upon the first stage of reconstruction of tramways in the city on Monday, and workmen are engaged in pulling up the wood-paving in Steelhouse-lane preparatory to laying-down the tram lines from the corner of Snow-hill, to form a junction with the existing lines at Lancaster-street and Aston-street. This portion will be electrified in conjunction with the Aston route.

A Local Government Board inquiry was held at the Castle, Tonbridge, on Friday, before Mr. M. K. North, with regard to the applications of the Tonbridge Urban District Council for power to borrow £400 for the purposes of the Small Dwellings Act; and £130 to carry out a new scheme of surface water drainage in the St. Stephen's district.

Mr. Ritchie, M.P., laid on Tuesday the foundation-stone of a new harbour of refuge at Pwllheli, which is to cost £60,000, two-thirds of this amount being provided by the Treasury and the Cambrian Railways Company.

A large clock with Cambridge chimera has just been erected in Pen-y-fai Church, Glamorganshire, by John Smith and Sons, Midland Clock Works, Derby.

LEGAL INTELLIGENCE.

IN RE MRS. PORTER, NORWICH.—At the Norwich Bankruptcy Court last week the examination took place of Charlotte Porter, wife of Henry Searles Porter, residing at Park-lane, Norwich, brickmaker and building estate proprietor, carrying on business separately from her husband at Park-lane, Sprowston Brick Works, and Roman Hill Brick Works, Lowestoft. Gross liabilities, £49,046 12s. 2d. Expected to rank, £6,880 13s. Estimated surplus, £4,915 10s. 10d. In reply to the Official Receiver, the debtor said she commenced business in 1881. Her husband was Mr. H. S. Porter, an undischarged bankrupt, and it was in consequence of her husband being an undischarged bankrupt that she went into the business. All that she did was to lend her name and sign documents. She had little money of her own, and with the exception of £100 she brought nothing in. She kept no books of account, and the only record she had was kept in her letter book. She had never put figures together, and her husband never showed her a statement. She now knew that there would be a large claim against the estate for a deficiency on the mortgages. Instead of there being a surplus of £5,000 there would be a large deficiency, a deficiency of many thousands. The examination was closed.

IN RE F. REEVES, OLD KENT-ROAD, S.E.—A first meeting of creditors was held on Monday under the failure of Frederick Reeves, marble and granite merchant, of Bridge Wharf, Old Kent-road, S.E. Mr. Walter Boyle, assistant Official Receiver, presided. The debtor states that he traded under the name of Thomas Reeves, that of his father, from whom he took over the business in October, 1897. He attributes his insolvency to his inability to collect debts due to him and loss through an attempt to float a company to take over his business. The statement of affairs showed gross liabilities amounting to £12,248 14s. 1d., of which £11,265 9s. 8d. was expected to rank, and assets £2,708 7s. 5d. The debtor was adjudged bankrupt on the 15th inst. It was resolved that Mr. J. H. Merrett, chartered accountant, should be trustee of the estate, with a committee of inspection.

THE LONDON WATER ARBITRATION.—The Court of Arbitration appointed under the Act of last year to adjudicate upon the claims made by the eight Metropolitan water companies on the transfer of their undertakings to the Metropolitan Water Board opened their sittings on Monday at the Institution of Mechanical Engineers, Sir E. Fry presiding. The total claims of the companies, in addition to their debenture stocks, amounted to £47,435,000, against which a total amount is offered by the water board of £10,250,000. Counsel for the East London Water Company opened their case on Monday. The chief witnesses examined on Tuesday, Wednesday, and Thursday have been Mr. William B. Bryan, chief engineer, and Mr. Daniel Hill, one of the auditors to the East London Company.

CLAIM AGAINST ARCHITECTS.—At the Darwen County-court, Messrs. Dunkerley and Co., Limited, claimed from Messrs. Woods and Thackeray, architects, the sum of £32 18s. 6d. for iron goods delivered. Mr. J. Hindle, jun., for the defendants, denied liability on behalf of Mr. C. Woods, on the ground that the iron goods involved in the claim were ordered by Mr. Thackeray, the other partner, on his own private account, and not on behalf of the firm. The goods were delivered from Spring Vale Station to Mr. Bury, an ironfounder in Bury-street, to whom he owed money, and Mr. Thackeray was paid for them by Mr. Bury, less £15, the amount of the debt. Mr. Thackeray could give no explanation of the goods being ordered, and no bill had been rendered. He argued that the order, as placed by Mr. Thackeray, did not come within scope of the partnership. His Honour said the case involved a very nice and correct reading of the law. Mr. Woods said the partnership between himself and Mr. Thackeray was dissolved in July, and at that time he knew nothing at all of that account. Upon the dissolution of partnership witness asked Mr. Thackeray for his keys, but he declined to give them up until all outstanding accounts had been squared. Upon that witness put a fresh lock on the letter-box. A fortnight after the dissolution witness received an "account rendered" for the amount of the debt. Knowing nothing about it, he asked for particulars, and ascertained that the iron girders for which the money was owing had been delivered from Spring Vale Station to Mr. Bury, who had paid Mr. Thackeray for them as to £15 by settlement of the outstanding account. As a firm, Messrs. Woods and Thackeray had never dealt with Messrs. Dunkerley, although they had many times specified their goods. Mr. Thackeray had admitted his personal liability in respect to the goods to witness. Mr. Bury, ironfounder, said that Mr. Thackeray owed him £15 privately, and he had asked for payment many times. He had the debt in mind when he ordered the iron goods from Mr. Thackeray, and told him that the debt owing would be taken into account on the settlement. He never saw anyone other than Mr. Thackeray in the matter, and his transaction was not with the firm.

His Honour reserved his decision until the next Court, when he gave judgment for defendant, and upon the application of Mr. Hindle, who represented the defendant, costs were allowed against the plaintiffs and Mr. Thackeray.

CURIOUS LIGHT AND AIR APPEAL.—**RUSCOE V. GROUNDSELL.**—In the Court of Appeal, on Wednesday, Lord Chancellor, the Lord Chief Justice of England, and Lord Justice Cozens-Hardy, gave judgment in the case of *Ruscoe v. Groundsell*, an appeal by the plaintiff from the judgment of Mr. Justice Lawrence in an action tried before him at the Lincoln Assizes. Mr. Stewart Smith, K.C., for the appellant, said that his client was the owner of two cottages at Louth, in the county of Lincolnshire, and he brought his action against the respondent, who was the owner of the land on the western side of the cottages, to restrain him from interfering with the free access of light to the windows of the cottages. Each of the cottages had windows overlooking the respondent's land, which land had up to 1891, and for over fifty years before, been used as an open yard. But in 1891 the respondent had erected a shed at a distance of less than a foot from the windows of the cottages. That shed, which was 48ft. in length and 7ft. high, seriously obstructed the light to the windows. The respondent claimed that there had been an agreement in writing, within section 3 of the Prescription Act, which excluded the appellant from setting up a claim to ancient light, and, in support of that contention, he relied on a tablet set in the respondent's wall, on which was engraved as follows:—"1816. This stone is placed by John Atkin to perpetuate John Musgrave's right to build within nine inches of this and any other building." It was admitted that the cottages had been built before 1816. Mr. Justice Lawrence was of opinion that the tablet prevented the appellant from acquiring a right to light, and gave judgment for the defendant in the action. Counsel submitted that an agreement within section 3 must be such a one as would form part of the title to the property and one which a vendor would be bound to disclose. Further, this was not an agreement expressly made or given for the purpose of defeating the right to light. He referred to "*Mitchell v. Cantrell*" and "*Bewley and Atkinson*." The wording of the agreement left it so doubtful as to what it meant that it could not be said to be an agreement expressly made for the purpose of preventing the acquisition of a right by prescription to light. It might well be that the tablet had been put up to mark the boundary of the two properties, and the fact that 9in. was mentioned as the line up to which Musgrave might build rather pointed to the conclusion that the tablet was put up for that purpose. Mr. Etherington Smith, for the respondent, submitted that the fact that the stone was placed in the wall by John Atkin, was an acknowledgment by him that he was enjoying the light by the consent of Musgrave. The tablet must refer to the enjoyment of light, as it would be quite unnecessary to perpetuate the right of Musgrave to build on his property, which no one could dispute. The Lord Chancellor, in delivering judgment, said that, in his opinion, the appeal must succeed. Everything but one point in the case was covered by authority. The appellant had proved that the light to the windows of the cottages had been enjoyed for 50 years, and the onus fell on any one wishing to disturb that right to light to show that he had not acquired a right by prescription to a continuance of the same. Those who sought to do that must establish that a continuance of the right to light had been prevented by that which the Prescription Act, 2 and 3 William IV. c. 71, required to be done in order to defeat that right, namely, that the same was enjoyed by some consensual agreement expressly made or given for that purpose by deed or writing. He would assume that the tablet on which the respondent relied was an agreement in writing. The question remained whether it expressly reserved the right and was given for that purpose. Looking at the possible reasons why the parties might have agreed to put the writing there, he was unable to hold that it was in the minds of the parties to reserve to Musgrave the right to interfere with the access of light to the cottage windows. There might well be a number of reasons why the writing had been placed where it was, and looking at all the facts and especially to the mention of the 9in., he was wholly unable to come to the conclusion that it was a right expressly reserved for that purpose. The Lord Chief Justice and Lord Justice Cozens-Hardy concurred, and the appeal was allowed with costs.

The Sheffield Corporation are seeking the sanction of the Local Government Board to the borrowing of £27,740, the estimated cost of the erection of 126 artisans' dwellings at High Wincobank.

At St. Dunstan's parish church, Cranbrook, on Tuesday week, Viscount Goschen unveiled a South African War memorial to Weald of Kent Volunteers. It consists of a framework of porphyry surrounding a copper plate, bearing an inscription, and was designed by Mr. W. D. Caröe, diocesan architect.

Our Office Table.

The annual conversazione of the Architectural Association was held at the galleries of the Royal Institute of Painters in Water Colours on Wednesday evening, when about 620 members and guests attended, and were received by the President, Mr. Henry F. Hare, F.R.I.B.A., and Mrs. Hare. Mr. Hare was supported by the vice-presidents, Messrs. R. S. Balfour and Arnold Mitchell; the hon. secretaries, Messrs. Louis Ambler and Henry Tanner, jun., and by the members of the committee. Among those present were Messrs. S. H. Fellowes-Pryne and Leonard Stokes, past-presidents, W. E. Riley, T. R. Spence, Alex. Graham, M. B. Adams, A. Burnell Burnell, and G. Gilbert Scott. During the evening selections of music were rendered by Pitman's Viennese Orchestra, and vocal selections and recitations by Mr. F. Chester. The Oil Painters' Exhibition was on view, also the premediated and other drawings by students of the Architectural Association. The day-school students also exhibited some admirably executed specimens of their work, and many architectural photographs by members of the Camera and Cycling Club were hung on the screen, including some excellent illustrations of Fountains Abbey, the work of Mr. Gilbert H. Lovegrove and members of the recent A.A. Excursion.

LONDON is not, apparently, to have a monopoly of Building Trades' Exhibitions. We hear it is proposed to organise one at Sheffield, to be held in the spring of next year; and whilst wishing the promoters success, we fear that the manufacturer and merchant are getting a little tired of exhibitions, having found by experience that the amount spent on them, which is not inconsiderable, can be utilised to far more beneficial advantage in appealing direct to their prospective customers through the medium of the professional journals, which admittedly produce best results. There is comparatively little difficulty in getting exhibitions together; the trouble is to induce the right sort of public to visit them.

MR. CHARLES J. WELD-BLUNDELL, lord of the manor, has just commenced a costly scheme for the development of Amsdale-on-Sea, between Southport and Formby, on the Lancashire coast. A steel pier, a mile long, to cost £26,000, will be erected, and pleasure steamers will sail therefrom to the Isle of Man, Llandudno, &c. A double esplanade is being constructed, to extend to Formby on the one side and Southport on the other, which will be one of the finest marine drives in the world. There will be a hydro and villas built on the promenade facing the Irish Sea. There will also be an ornamental lake, spanned by bridges, while grounds are being laid out for golf, &c. Large sandhills which have taken centuries to accumulate have been levelled.

THE council of the Roads Improvements Association have discussed the report of the Departmental Committee on Highways. Great satisfaction was expressed with the recommendations of the committee, and it was resolved to take all possible steps to induce Parliament to legislate upon the lines of the report, and, in particular, it was agreed—(1) That the President of the Local Government Board should be asked to receive a deputation to urge the desirability of legislation during the next Session of Parliament; (2) that an epitome of the report should be sent to every member of Parliament with a suggestion that he should use his influence with the Government to induce them to introduce legislation on the lines laid down in the report; and (3) that pressure should be brought to bear upon Ministers seeking re-election to support the recommendations of the committee.

Colonel A. G. Durnford, R.E., Local Government Board inspector, held an inquiry last week at Hove with reference to the town council's application for sanction to borrow £15,000 for purposes of electric lighting.

At Liskeard parish church, on Friday, the vicar dedicated a new stained-glass window placed in the church. The fourlights are filled with large figures of martyrs—viz., Bishops Ridley and Latimer, Agnes Prest and Anne Askew—each standing amid the flames and carrying the Book of the Gospels. In the tracery openings are angels bearing scrolls.

The urban district council of Sevenoaks decided at their last meeting to raise the salary of Mr. S. Towson, their surveyor, from £200 to £250 per annum.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Opening Address by Aston Webb, R.A., F.S.A., President. 8 p.m.
Liverpool Architectural Society. "Street Architecture, Formal or Irregular," by W. Curtis Green.
Society of Engineers. "Bacterial Treatment of Sewage," by George Thudicum, F.I.C., Royal United Service Institution. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Address by the President, Sir William White, F.R.S. 8 p.m.

FRIDAY.—Architectural Association. "Modern Churches," by C. A. Nicholson. 7.30 p.m.
Glasgow Architectural Craftsmen's Society. "Santa Sophia, Constantinople," by Prof. Gourlay, B.Sc., A.R.I.B.A. 8 p.m.

CHIPS.

The International Fire Exhibition, organised under the auspices of the British Fire-Prevention Committee with the view of arousing public interest in fire prevention and fire protection generally, was closed on Saturday last, after a duration of about six months from the opening.

The Marquess of Londonderry opened on Wednesday a new wing of the Northern Polytechnic Institute, Holloway, which has been erected at the cost of £16,000 to meet the growing wants of the students. On the ground floor of the extension are workrooms for plasterers, masons, bricklayers, and painters, there being in the building trades section about 200 students.

At Wednesday's meeting of the Folkestone Corporation it was resolved, subject to the opinion of an expert and counsel, to accept the offer of the proprietors of the "G.B." Surface Contact Tramway System to lay down a tramway from the Harbour to the Cheriton boundary. The capital outlay will be just over £30,000 (exclusive of the cost of widening Cheriton-road). This will practically connect Shorncliffe Camp with the centre of Folkestone.

Lavender Lodge, a freehold estate of three acres, situate at St. John's-road, Clapham Junction, was sold at the Mart on Wednesday for £46,000. The property has frontages of 385ft. to St. John's-road, of about 217ft. to Lavender-sweep, and 328ft. to Limburg-road.

The life-work in water-colours of the President of the Royal Academy, and over 100 studies for his pictures in oil, will constitute the opening Exhibition of the Fine Art Society's season. Sir Edward Poynter's Exhibition is a fitting sequel to those of his predecessors in the Presidential chair—viz., Lord Leighton and Sir John Millais, both of whose studies were introduced to the public at these galleries. The Exhibition opens on Monday next.

The council of St. Michael's College, Aberdare, have unanimously accepted a site of two acres at Llandaff, offered by Mr. W. S. De Winton, and resolved to erect thereon college buildings. The cost is estimated at £200,000.

The church of St. David's, Tonyrefail, built at a cost of £3,500, was consecrated on Thursday in last week by the Bishop of Llandaff. The bishop, speaking after the ceremony, said that during his episcopate of twenty years he had consecrated 200 churches in the diocese, a large proportion of the number being in the Rhondda.

The restoration now in progress at All Saints' Church, Toynton, Lincolnshire, has brought to light some interesting features. On the south side of the nave wall is an arcade of four bays of Decorated character; two limestone pillars, octagonal in shape, but somewhat strangely standing on square bases, moulded capitals clearly cut, and 6ft. 6in. high, and 10ft. 6in. apart. In the north wall was found an arcade of five bays of about 9ft. each, three pillars and two half-pillars, Norman style, about 1150 A.D., or 200 years earlier than the south arcade. Traces of Norman painting may still be seen on the arches, but the whole of the north arcade is much damaged by fire.

The Castle Ward Rural District Council at their last meeting formally adopted the revised scheme for the sewerage and sewage disposal of Heddon-on-the-Wall, prepared by Mr. Harry W. Taylor, A.M.I.C.E. The Board of Trade required the sewage to be purified before its discharge into the tidal river Tyne, which has increased the cost. Application to the Local Government Board to borrow £2,600 will be made immediately.

The opening ceremony in connection with the Johnstone Constitutional Club at Johnstone, N.B., took place on the 22nd inst. The new club has been erected at a cost of £3,000. It is situated in the neighbourhood of the main square, has a frontage of 102ft., is two stories in height, and is faced with brick. It includes a large hall accommodating 300 people, committee-rooms, billiard-room, reading-room, games-room, and skittle alley. Mr. Watson is the architect.

LIST OF COMPETITIONS OPEN.

Skewen—Public Library (limit £2,000)	£10 10s.	Samuel Jones, Clerk, Old-road, Skewen, Neath	Nov. 9
Kilmarnock—Tenement of Shops and Workmen's Houses	£15 15s., £10 10s., £5 5s.	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	" 9
Newport, Mon.—Sewerage Scheme		T. S. Edwards, Clerk, 24, Stow Hill, Newport, Mon.	" 11
Sunderland—Additions to Town Hall	£100, £50, £25.	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	" 21
Bray—Pavilion and Winter Gardens	£30, £15, £10, and three of £5 5s.	Frank Bethell, Hon. Sec., Town Hall, Bray	" 31
Wakefield—Reconstructing Cattle Market	50gs. (merged), 25gs.	R. Ernest Langhorne, Solicitor, Wakefield	Dec. 1
Elgin—School (340 places)		Hugh Stewart, Clerk, Elgin	" 7
Selly Oak—Public Baths (Assessor)		A. W. Cross, A.M.I.C.E., 23, Valentine-road, King's Heath	" 7
Herne Hill, S.E.—Public Library		H. J. Smith, Clerk, Lambeth Town Hall, Kennington Green, S.E.	" 16
Windsor—Elevations for Police and Fire Brigade Stations	25gs.	E. A. Stickland, A.M.I.C.E., Borough Surveyor, Windsor	Jan. 15
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Consulate-General, 22, Laurence-Pountney-lane, E.C.	Mar. 31
Liverpool—Cotton Exchange (Local Architects)		Peter Brown, Sec., 50, Brown's Buildings, Liverpool	"
Oldham—Board School		J. Rennie, Clerk, School Board Offices, Oldham	"
Llwynypia—Workmen's Hall (1,500 seats)		The Secretary, Workmen's Institute, Llwynypia, Wales	"
Fraserburgh—Infectious Diseases Hospital and Public Library		William Alexander, Burgh Surveyor, Fraserburgh	"
Rhyl—Pavilion (10,000 places) at National Eisteddfod		H. A. Tilly and J. W. Jones, Gen. Secs., Towd Hall, Rhyl	"

LIST OF TENDERS OPEN.

BUILDINGS.

Bristol—Central Library, Deanery-road	Library Committee	H. Percy Adams, F.R.I.B.A., 28, Woburn-place, Russell-sq., W.C.	Oct. 31
Clonmel—Methodist Church and Manse	Corporation	The Rev. H. Kevin, Clonmel	" 31
Glasgow—Wright Work Fittings at Kingston Public Library	Corporation	The City Engineer's Office, City Chambers, Glasgow	" 31
Troedyrhiw—Resecting and Renovating Saron Ind. Chapel	Guardians	T. Roderick, Architect, Glebeland, Merthyr Tydfil	" 31
Runcorn—St. John's Presbyterian Church, Victoria-road	Guardians	Thos. W. Cubbon, Architect, 51, Hamilton-street, Birkenhead	" 31
Christchurch—Altering Board Room at Workhouse	Guardians	A. Druiet, Clerk, Christchurch, Hants	" 31
Thornaby-on-Tees—Additions to the Public Library	H. Bray and Co.	E. A. Whigham, A.R.I.B.A., 59, High-street, Stockton	Nov. 2
Inverurie—Two Houses and Six Cottars	H. Bray and Co.	Walker and Duncan, 3, Golden-square, Aberdeen	" 2
Rotherham—Business Premises	H. Bray and Co.	J. Platts, Architect, High-street, Rotherham	" 2
St. Columb Minor—Wesleyan Church	Guardians	Sampson Hill, Architect, Green-lane, Redruth	" 3
Belfast—Alterations at Dispensary Stations	Guardians	Young and Mackenzie, Engineers, Belfast	" 3
Troedyrhiw—Stable	Guardians	J. Jones and Co., Pontyrrun Stores, Troedyrhiw	" 3
Stoke-on-Trent—Repairs to Franklio's Farm	Guardians	A. P. Miller, Architect, Frederick-street, Hanley	" 4
Hayle—House	Metropolitan Asylums Board	H. T. Broad, Builder, Hayle	" 4
Winchmore Hill, N.—Demolishing Wards at Hospital	Guardians	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 4
Barnsley—Business Premises, Eldon-street	Guardians	Crawshaw and Wilkinson, Architects, 13, Regent-street, Barnsley	" 4
Willesden, N.W.—Ward Block at Workhouse Infirmary	Guardians	A. Saxon Snell, F.R.I.B.A., 22, Southampton Bldgs, Chancery-l., W.C.	" 4
Burntisland—St. Serf's Episcopal Church	Elementary Education Committee	Wm. Roger Simpson, Architect, 6, Bentfield, Burntisland	" 4
Gillingham—Twenty-six Cottages, Burnt Oak-terrace	Elementary Education Committee	Ernest J. Hammond, M.S.A., 21, Balmoral-road, Gillingham	" 5
Kelley—School	Elementary Education Committee	C. R. Dalgleish, Architect, Shrewsbury	" 5
Assouan, Egypt—Hospital	Corporation	The Central Office, Sanitary Department, Cairo	" 5
Chichester—Open Shed at Cattle Market	Fermanagh County Council	L. Pym-Jones, City Surveyor, Lion-street, Chichester	" 6
Enniskillen—Cells at Court House	London County Council	H. Hugh Archibald, Secretary, Court House, Enniskillen	" 6
Hebden Bridge—Bowling-Green on May Royd Estate	School Board	J. Howard, Secretary, Foster-lane, Hebden Bridge	" 6
Ewell—Laundry and Mortuary	School Board	The Clerk of Asylums Committee, 6, Waterloo-place, S.W.	" 6
Windsor—Shop and House, St. Leonard's-road	School Board	Percy H. Grove, Architect, 14, Alma-road, Windsor	" 7
Barrow-in-Furness—Sailors' Home on Parow Island	School Board	C. Massop, Hon. Secretary, Furness Railway, Barrow	" 7
Aberystwith—Additions to Nautylo School	School Board	R. L. Roberts, Architect, Abercrombie	" 9
Leeds—Extensions of Workhouse Hospital	Hampstead General Hosp. Committee	Thomas Winn and Sons, Architects, 92, Albion-street, Leeds	" 9
Haverstock Hill, N.W.—Hospital	Guardians	Young and Hall, Architects, 17, Southampton-st., Bloomsbury, W.C.	" 9
Norwich—Additions to Workhouse Laundry	H.M. Commissioners of Works	Morgan and Buckingham, Architects, Norwich	" 9
Leicester—Government Offices	Board of Guardians of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 10
Limerick—Laundry, Chimney Shaft, &c., at Workhouse	H.M. Commissioners of Works	H. J. Guinane, Union Clerk, Limerick	" 10
Southampton—Additions to Ordnance Survey Offices	Lewisham Public Libraries Com.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 10
Lower Sydenham—Branch Library	Lambeth Guardians	J. R. Vining, 89, Chancery-lane, W.C.	" 10
Norwood—Repairs to School Infirmary	H.M. Commissioners of Works	W. Thurnall, Clerk, Brook-street, Kennington-road, S.E.	" 11
St. Columb—Reconstructing Workhouse Infirmary	Wallasey Education Committee	C. E. Whitford, Clerk, St. Columb	" 11
Manchester—Telephone Exchange, Quay-street	Guardians	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 11
Lisac—School (1,000 places), Manor-road	Guardians	Edmund Kirby, F.R.I.B.A., 5, Cook-street, Liverpool	" 14
Bradford—Enlargement of Central Offices, Manor-row	Education Committee	Empall and Clarkson, 7, Exchange, Bradford	" 16
Portsmouth—School, Reginald-road	Admiralty	G. E. Smith, Architect, 145, Victoria-road North, Southsea	" 20
Felixstowe—House at Coast-guard Station	Education Committee	The Coastguard Station, Felixstowe	" 20
Tottenham, N.—Altering Lancasterian Schools, Church-road	Urban District Council	G. E. T. Laurence, Architect, 22, Buckingham-street, Adelphi, W.C.	" 23
Knaresborough—Furrier House	Midland Railway Co.	J. E. Walker, Surveyor, Town Hall, Knaresborough	" 28
Sheffield—Fifty Workmen's Cottages	Burial Board	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	"
Bradford—House, &c., Canal-road	Burial Board	Aird and Calder, Navigation Offices, Dock-street, Leeds	"
Newhaven—Altering Primitive Methodist Chapel	Burial Board	F. J. Rayner, Architect, Fort-road, Newhaven, Sussex	"
Knaresborough—Two Semi-Detached Houses	Burial Board	Wm. Driffield, Architect, Boroughbridge-road, Knaresborough	"
Pinner—Restoration of Chapels	Burial Board	Harrison and Ward, 66, Victoria-street, Westminster, S.W.	"
Liphook, Hants—Country Residence, Cottage, and Stabling	Burial Board	J. A. Soutar, Architect, 41, Bishopsgate-street Within, E.C.	"
Menston—Two Pairs of Semi-Detached Villas	Burial Board	William H. Sharp, Architect, 239, Rooley-lane, Bradford	"
Adel, Leeds—Detached Cottages	Burial Board	George W. Atkinson, Architect, 1, Mark-lane, Leeds	"
Hookey Hill—Office and Stable	Burial Board	Borton and Percival, Architects, 150A, Stamford-st., Ashton-u-Lyne	"
Newport—Arcade Premises, High-street	Burial Board	Habershon, Fawcner, & Co., Architects, 41, High-st., Newport, Mon.	"
Ebbw Vale—Rebuilding Shops and Premises	Burial Board	B. J. Francis, Architect, Abergavenny	"

ELECTRICAL PLANT.

Todmorden—Plant	Corporation	H. Waring, Electrical Engineer's Office, Todmorden	Oct. 31
Swansea—Ducts, &c.	Corporation	C. A. L. Frummann, Borough Electrical Engineer, Strand, Swansea	" 31
West Ham—Wiring Abbey Mills Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Nov. 3
Manchester—Laying Telephone Pipes	Paving Committee	The City Surveyor's Office, Town Hall, Manchester	" 5
Chichester—Telephones	Corporation	L. Pym-Jones, City Surveyor, Lion-street, Chichester	" 7
Wakefield—Two-Phase Generator (400-kw.)	Town Council	The City Electrical Engineer, Calder Vale-road, Wakefield	" 9
Beckenham—Electric Wiring Houses	Urban District Council	John A. Agell, Surveyor, Council Offices, Beckenham	" 10
Derby—Telegraph Instruments	Midland Railway Co.	Alfred Derry, Stores Superintendent, Derby	" 10
Radcliffe—Electric Lighting	Urban District Council	Lacey and Sillar, 2, Queen Anne's Gate, Westminster, S.W.	" 14
Blackpool—Traction Set	Electricity and Tramways Committee	Charles Forness, Borough Electrical Engineer, Blackpool	" 15
Kilmarnock—Plant	Corporation	Kennedy and Jenkin, Engineers, 17, Victoria-street, Westminster	" 18
Widnesbury—Electric Lighting Public Buildings	Corporation	F. J. Warden-Stevens, A.M.I.M.E., 31, Victoria-st., Westminster	" 20
Sydney—Telegraph Materials	Guardians	The Deputy Postmaster-General, Sydney, New South Wales	Dec. 30
Ludley—Electric Power and Light Installation at Workhouse	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	"

ENGINEERING.

Sowerby Bridge—Purification Works	District Council	Spinks and Pilling, Engineers, 20, Park-row, Leeds	Oct. 31
Tregaron—Service Reservoir	Harbour Trustees	J. Davies and Son, A.M.I.C.E., Llanelli	" 31
Wick—Wharf	Corporation	James Barron, M.I.C.E., Aberdeen	" 31
Swansea—Tramways, &c.	Urban District Council	George Bell, Borough Surveyor, 13, Somerset-place, Swansea	Nov. 2
Kilnsbridge—Waterworks	Ministry of Public Works	T. W. Latham, Engineer, Kingsbridge	" 2
La Puella de Cam Mize, Corunna—Wharf Works	Norfolk and Suffolk Jnt. Ry. Committee	The Ministry of Agriculture and Public Works, Madrid	" 2
Cromer to Mundesley—Railway (9½ miles)	Elle Local Authorities	William Marriott, Engineer, Melton Constable, Norfolk	" 2
Arncroft—Water Supply Works	Health Committee	G. S. Carrage, C.E., 1, Erskine-place, Edinburgh	" 3
Birmingham—Destructor	Spennymoor and Tudhoe Gas Co.	The Superintendent, Montague Wharf, Birmingham	" 3
Spennymoor—Gasholder Tank	Town Council	Wm. Cowley, Secretary, Gasworks, Spennymoor	" 3
Portsmouth—Pumping-Station	Newton Abbot Rural Dist. Council	The Borough Engineer's Office, Town Hall, Portsmouth	" 3
Bovey Tracey—Reservoir	Town Council	Wm. Fox and B. A. Tatton, M.M.I.C.E., 5, Victoria-street, S.W.	" 3
Queensborough—Water-Main	London County Council	H. Small, Borough Surveyor, Town Hall, Queensborough	" 3
West Ham—Engine, Dynamo, &c., Abbey Mills Pumping Sta.	Baths and Lodging Houses Committee	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 3
Belfast—Heating Carrick House	Guardians	Sir Samuel Black, Town Clerk, Belfast	" 4
Wolverhampton—Laying Pipes at Workhouse	Joint Railways Co.	Frank Harrison, Clerk, St. Peter's Close, Wolverhampton	" 4
Stranraer—Pier Widening	South Dublin R.D.C.	J. Thomson, Secretary, Citadel Station, Carlisle	" 4
Dublin—Wells at Bluebell and Ballyfermott	Rural District Council	T. J. Byrne, A.R.I.B.A., 1, James's-street, Dublin	" 4
Burntisland—Heating St. Serf's Church	Urban District Council	Wm. Roger Simpson, Architect, 6, Bentfield, Burntisland	" 4
St. Austell—Waterworks	Urban District Council	T. H. Andrew, Engineer, 1, Trevanick Villas, St. Austell	" 4
Watford—Sewerage Works	Urban District Council	H. Morten Turner, Clerk, Council Offices, Watford	" 4

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PROFESSIONAL ENCROACHMENTS.

SEVERAL practical questions are before the profession just now. One of them is that of Education and Registration, which is being discussed with more or less keenness by nearly all the architectural societies, and has been made one of the subjects in the inaugural addresses. This question has been forced upon the profession by various considerations. Another question of equal interest is that the growing competition between the professions has been the cause of much overlapping, of members of one class interfering with the work of another. If we take the professions engaged in building and landed estates, a great deal of this overlapping or interference is taking place. The surveyor in a provincial town does not hesitate to prepare plans for buildings of an ordinary kind, and to undertake designs for houses, shops, and commercial premises, in addition to his more special duties of surveying, estate management and valuations. It must be admitted also that the architects by no means set a good example. Many of them in country towns undertake valuations of property, estate agency, quantity surveying, and are ready to enter into various matters which are not properly within their sphere. In the nature of things there is a law of reprisal. If one business or profession encroaches upon another, that other will defend itself by following the same example. When large drapery firms begin to sell jewelry and fancy articles in addition to their own business; when plumbing firms undertake general sanitary and ironmongery business, and when decorators go in for plumbing and other trades, we are not surprised if the professions suffer from the same encroachments. Nothing can be more destructive to the growth and progress of craftsmanship, than this indiscriminate interference of one trade with that of another. In the building trades it has been productive of considerable mischief and harm to the efficient tradesman and skilled mechanic. The mason complains of the bricklayer undertaking stonework, the skilled slater complains of the tiler's interference in laying slates, the competent plumber protests against the ironmonger tendering for plumbers' work and fittings, and the competent painter of various other trades interfering with his own. But the evil does not stop here: the public and the building owner suffer. The competent tradesman would be perfectly safe if his employers were able to distinguish between good and bad workmanship; unfortunately, they are not in many instances. The tests of good workmanship are not always visible, and they are apparent only to the eye of the practised builder. How much passes muster in brickwork, tile-hanging, slating, plumbing, and plastering which would not bear examination if the proper tests were applied! Then the cheaper competitors for work who carry on other trades besides their own can make an easier bargain with contractors: they are unrestricted, the rules of unions do not apply. These causes are injurious to the skilled tradesmen, and they are gradually undermining the standards of good work; the untrained hands, those who have not been apprenticed to the trade, are gradually ousting the skilled craftsman. Mr. Thomas Winder, the President of the Sheffield Society of Architects and Surveyors, in his opening address, spoke of the encroachments taking place among professional men, and the measures taken by the Surveyors' Institution

which amounted to making surveying a closed profession. He said, "Sooner or later the question would have to be faced both by surveyors and architects in consequence of the action of members of another profession. No architect or surveyor of standing would dream of drawing up legal documents, or of interfering with legal questions, and it was greatly to be regretted that members of the legal profession were abandoning professional traditions and encroaching seriously upon the duties of the surveyor, the valuer, and the land agent. Large numbers of plans were being drawn upon legal documents, often most incorrectly, by irresponsible junior clerks in solicitors' offices, and drawn with but little understanding of the meaning of the work or ability to make a correct plan. These plans were charged for, and this was unfair to clients, and would prove a fruitful source of litigation. Solicitors were also computing areas of plots, subdividing leaseholds, negotiating sales (including valuation), and, wherever possible, absorbing the duties and emoluments of surveyors and land agents. This was but another phase of the curious system by which one went to the draper for plumbing repairs, and to the chemist for stationery and literature, and it had been greatly stimulated by the issue of that most misleading publication the 4 to 1 in. Ordnance Map." We do not share the opinion as to the large-scale map, which has been found of great use by the professional surveyor; but the interference of the legal firm with estate matters and valuations and the drawing of plans is strongly to be deprecated as encroaching on the emoluments of the surveyor and estate agent. We cannot wonder that the Surveyors' Institution should have adopted alterations to their rules, and have taken steps in the direction of closing the profession. There is nothing now to prevent a solicitor from drawing his own plans of properties on deeds, of making valuations, computing areas, negotiating the sale of property, and doing many things that properly belong to the province of the surveyor and valuer. The junior law clerk, if he can draw, is often employed to put plans on documents and to make drawings which, properly, should be done by the architect or surveyor. Registration will, by rendering all services done by registered practitioners legally chargeable, render such outside interference of less value. Only the qualified practitioner will be held responsible to the client, and it is in this way only that the interference of legal practitioners and others in the manner mentioned can be prevented. There are many duties done by the professions of surveyor and architect which have become more or less common property. The drawing of plots of land to scale, negotiations relating to valuation and compensation, even the valuation of property, can be easily learned by the solicitor or his clerks, and when they have acquired such knowledge they are inclined to make use of it, especially if by such devices they can increase their remuneration and fees. There is always this risk attached to occupations that are within the grasp of the average man. They are likely to be invaded by people who have a general knowledge, so it is that the architect's vocation is so often considered to be "good game" for amateurs and others who have a smattering of building or art, and many a man of business thinks he is quite competent to conduct his own negotiations for acquiring property, buying houses, making valuations, and the like. We have even known men of this kind become their own architects and builders, in defiance of the good old adage that a man who is his own lawyer has a fool for his client. There are people in the same way who discuss political or theological questions with all the confidence of experienced statesmen and theologians. They imagine because the subject appears easy to them they

are at full liberty to pronounce an opinion; so with men who have a smattering of architecture; they can talk with composure on the design of the latest building and criticise architects' work. But though certain vocations appear easy, and the instrumental agencies employed by the professional man are simple in themselves, it by no means follows that the opinion or the design, whichever it is, is worth anything. The vocation of the architect and surveyor can only be acquired after long study and experience. Such an exercise of thought as a plan or a valuation entails cannot be so readily undertaken as the average man imagines, and any attempt to do so must end in disappointment or failure. The most disastrous interferences have been caused by tradesmen and others who have interfered with the designs and intentions of professional experts. We can imagine what the result would be in the case of medical advice or surgery, or in legal questions. But in any of these cases no amateur would dare to interfere. If he did it would be to his own risk and peril. When so many professions and not a few other vocations are protected by statute, it becomes harder for those who have not the same advantage to tolerate the injustice of interference. The plumbers were exposed to the same grievance before they adopted registration. All sorts of trades: ironmongers, painters, furnishers, and others undertook the sanitary fitting-up of houses, and the result was disaster and risk to public health.

A great deal can be done to stop this grievance if the profession would reconsider their position. One of the first steps is to make themselves masters of their business. There are many of the younger men in the profession who have never equipped themselves in matters which concern their business. We know of men who are in the habit of asking advice on sundry questions of law, which they ought to know, matters affecting building operations, sanitary regulations, points bearing on construction with which they are unacquainted, who get tradesmen to give them advice, furnish designs and estimates for work they have not mastered, such as steel construction of floors and roofs, heating and ventilating arrangements, and even decorative trades like those connected with terracotta or faience, lead-glazing, electric-light installations, and metalwork. The result is demoralising: it disorganises the relations between the profession and the trades; the latter are inclined to take advantage, and the evils of overlapping and underbidding follow. There are also men in the profession who are glad to delegate a portion of their work to engineers and manufacturers, with the result that they give their profession away.

There is a want of loyalty amongst architects; we should say one of their first duties was to jealously guard any encroachment upon those trades which largely affect design, not to throw willingly into the hands of the engineer anything which rightly belongs to the architect—such, for example, as the arrangement of iron pillars, their details, the general form and profile of iron or steel roofs; not to allow the manufacturer to undertake the arrangement of tile pavements, or decorative faience, or leaded lights; nor to give the decorative artist a free hand to select his own designs for walls and ceilings. The costly and elaborately got up trade catalogue is rather an evidence of the transference of design for sundry trades from the architect's office or studio to the show-room. Many in the profession do not scruple to select patterns for decorative plaster, ironmongery, tilework, woodwork, terracotta, &c., and they may do worse, for unless they are proficient in technical knowledge their own designs may be faulty. The profession may, however, seriously lose its prestige and influence by neglecting the study of these

trades and by recommending their clients to choose their own grates, wall, and ceiling decoration, and tile pavements or wall hangings from the catalogues of firms without any instruction or guidance. Can we imagine anything more detrimental to architecture than to allow Mr. or Mrs. Jones or Brown to determine the kind of pattern or colour which should go into a certain room of their house. Possibly they select something which is at complete variance with the architect's design, a style which does not agree with that of the exterior, &c.; a colour which is quite out of accord with the size and aspect or light of the room. The evil of this complacency does not stop here. Next time Mr. Jones or Mr. Brown wants a house built or decorated he goes straightway to the trade firm and gets them to furnish designs and estimates. The example spreads. Mr. So-and-So finds out that Mr. Smith, the builder, prepares designs and estimates for buildings, or that the most elaborate and artistic designs for decoration are furnished by a large firm who do many architects' work and supply them with designs. The conviction takes root that these large trading firms can make their own designs, and that their direct employment saves the architect's fees. We do not say the educated refined client follows such an example, but there are hundreds of the public who do, who cannot make any distinction between ready-made stock designs and those which are the result of thoughtful study of the actual conditions, and a wide experience in design to be acquired only by special education. To raise the standard of education amongst architects, so that they may more jealously guard their own interests as professional advisers, is one of the chief ways to combat the threatened invasion of the rights of the profession. Men enter the ranks every day with only a very vague conception of the duties and responsibilities of the vocation; with imperfect views of the influence of architecture on the subsidiary arts and crafts. Only by defining the boundary and outworks of the profession by a course of study which shall take in all the side and by-paths can we hope to show the extent of the architect's vocation, and make the young practitioner realise his true position. The public, too, need to be informed. So long as they imagine the builder, or the estate agent, and decorator can furnish designs for houses, or that the firms of manufacturers can supply them with designs in the latest and best art fashion, they do not trouble to inquire into the vocation of the architect.

The kind of instruction required to raise the standard of the profession is one that will grasp the essentials of practical work in various branches. The architect must be taught to develop the powers of his mind so as to be capable of meeting contingencies whenever they arise. The mere acquisition of facts and book knowledge will not do this. He must know how to bring his mind to bear on the practical wants of building, be able to tackle any problem in construction, iron and steel; the details of terracotta; know sufficiently the principles of such things as plumbing, hot-water and steam-heating, ventilation, metal and woodwork, of ornamental design as applied to various trades, so as to be able to control and supervise them, and to determine their limits without having recourse to the opinions of others. Wherever the guidance of principles forsake him, he falls back on the extraneous aid of others to help him over the difficulty, and to furnish him with designs which are often without a true motive or logical basis.

BUSH HILL PARK CHURCH COMPETITION DESIGNS.

IN the rapidly developing and semi-rural neighbourhood of Bush Hill Park, near Enfield, a new church has been in contemplation to take the place of a temporary

structure which at present does duty. An excellent corner site between two roads—Village-road and Park-avenue—has been selected, and designs were sent in last July for the new edifice. Ten architects were invited to compete, and the results of their labours were on view last week at the estate office. The conditions were simple: the church was to seat 600 worshippers at a cost of £12,000, the material was to be either brick or stone—preferably the latter. As the competitors were not hampered as to site or as to style, a good opportunity was presented. Considerable talent and labour have been expended on the designs as a whole, and some of the drawings are finished with much care, and have highly-coloured perspectives. As usual, there is much wasted effort and misapplication of study in style, and only three or four of the designs can be seriously considered in regard to either plan or cost. Mr. W. D. Carie, F.R.I.B.A., the assessor, has selected three out of the ten designs, and has reported to the committee on their merits. This document is not made public, though we should have liked to have seen the grounds of the decision. Consideration of cost, no doubt, was chiefly uppermost in the mind of the assessor, in which case he had no alternative but to select a design which was simple in plan and treatment. The others have not the claim of simplicity to an equal extent, though they are well studied. One certainly has merit both in plan and detail. The design placed first by the assessor does not appear to have given satisfaction. The committee, at least, have made their decision, and have selected the third to be carried out, with apparently the consent of the assessor. The design first chosen is, it must be admitted, roughly drawn and inadequately shown, and there is no attempt at finish, and not a few of the competitors have expressed their astonishment at the decision. One of the competitors, a gentleman of some experience in church building, has indeed said that the award has, for him, taken away the bitterness of the disappointment. Be this as it may, there is a certain simplicity of treatment and quaintness in design which commends it to the artist, though these qualities will, with many, scarcely compensate for the roughness and unfinished appearance of the drawings. Draughtsmanship is certainly no indication of merit of design, though it may be an indication of personal interest. In the matter of style a church for a rural or semi-rural district as this is should certainly be treated in a less formal and dignified manner than would be proper to a town or suburban district. In Bush Hill Park it will not have to compete with lofty houses and buildings, but with villas mainly of two stories. We are not sure that this point has been taken into consideration. Nor is a very ornate style the most suitable for a rural parish. Two or three of the designs submitted are pretentious in style and their detail very elaborate. They have large and lofty towers with spires, while there are other designs which show very small and feeble apologies for them, which a church is better without, and cost more than their significance justifies.

The design placed first by the assessor, by Messrs. J. O. Scett and Son, "B. B.," comes with a good name; it has the merit of being in plan a simple solution, and avoiding all external breaks, which invariably add to the cost of building; the outer walls run through from end to end, only broken by the tower at the south-west corner, which stops the aisle. (We are here using the points of the usual Orientation.) The nave is four bays in length, the aisles are gabled, which supersedes a clerestory arrangement, and therefore any great height in the nave. The font is at the west end of nave. The vestries are at the north-east corner; the choir vestry projects beyond the aisle wall, and has an entrance externally

for the choir, as well as internally. It adjoins the clergy vestry, and the entrance from sanctuary is between the organ-chamber and the latter. A straight passageway from the choir vestry to the morning chapel is thus formed without steps. The chapel on south side is contained within the boundary of the south aisle wall, and has thirty-eight seats. The choir and sanctuary arrangements appear to be good. There are six steps to the foot-pace of altar, and a large five-light window is placed above the altar; the end of sanctuary projects a little beyond the morning chapel, and both have square ends externally. As a whole, the plan is a simple basilican type of arrangement, without transepts or projections of any kind. Externally, the treatment is plain almost to a fault, the gabled ends are very simply treated, and the tower is massive, the upper stage being octagonal, with indented parapet and buttress on each alternate side, springing from a broach, above which rises a slim shingle spire, such as one often sees in Sussex and Kent. The effect is picturesque. A full-proportioned tower and spire is not always desirable, as it is not an indispensable adjunct. As one authority on church building has said: "If a good tower cannot be had, it is better to leave it to be added afterwards, and the money which would build a poor tower is better spent in thickening the walls or improving the fittings." Internally the arcades are supported by square-shaped piers, from which spring obtuse-pointed arches. There is a plain series of lancets under one arch at the west end. There is a well-designed doorway on the west side of tower. The roof is boarded and "waggon" shape. The design the assessor placed second, under the motto "Virtute non Astutia" (W. O. Milne) is well grouped. The nave and chancel roofs are on same level throughout, the tower is at the south-west corner, with a narthex between tower and porch on the north side. These terminate the aisles. The plan is economical. The chancel, a square-ended termination, is the whole width of nave; there is a chapel next it on the south side, apsidal-ended, a little shorter than the sanctuary, and on the south side, projecting from the chapel, is a porch and baptistery. The position of the font here is objectionable, being too far from the west-end. With this exception, and the three steps down from chancel level to chapel, there is not much to find fault with. These steps occur on the north side of chancel to clergy and choir vestries. The vestries are well placed, and slightly project northwards. The nave has five bays of arches, and has an open timber hammer-beam roof. The length given in the plan indicates a narthex of 8ft., a nave 72ft. 3in. by 25ft. 8in., and 32ft. length of chancel and sacrum. The aisles are 11ft. 8in. wide. The tower is massively treated and of good height, crowned by a spire of moderate proportions, though of sufficient height. A well-drawn coloured perspective taken from the eastern end of church accompanies the plan and elevations, which are neatly executed and fully detailed. It would have been better if the steps to the chancel were mainly placed inside instead of outside the altar rail. For ordinary churches there may be one step at the entrance to chancel, and a second one at the entrance to sanctuary, the others within the latter.

The design placed third and since selected by the committee certainly shows ability; it is by Mr. J. S. Alder. The church has its axis rather north-east and south-west, and therefore does not orientate, one side being parallel to Village-road. The plan forms, as in the last, a parallelogram, except that the tower at the west end of south aisle (we are using the customary points of the compass in an ecclesiastical sense) and the corresponding porch on the north side break the line and project. There is a small semicircular baptistery at the west end of nave, which

has four bays of arches to the chancel. The clergy vestry and adjoining porch project also on the north side, while the choir vestry adjoins the sanctuary. This is questionable; the former vestry, at least, should communicate directly with the sanctuary. The morning chapel on the south side of choir and sanctuary does not project beyond the wall lines as in other plans, and the eastern wall is almost in a line with that of the sanctuary; but a porch projects on the south side of aisle next the chapel. The ritual arrangements on the whole are good. The nave accommodates 330, and the aisles 90 and 50 persons, the chancel 50, and the chapel 50—including other parts, 600 persons. From an architectural point of view the design of Mr. Alder holds its own; the proportions of the building are pleasing. The author has selected a rather late phase of the Decorated—perhaps a little more elaborate than necessary, but we should say within the amount likely to be expended. There is a slight transeptal break at the chancel externally; the aisle windows have traceried heads, and the clerestory lights are in pairs in each bay. The spire is of commanding proportions, and the base is surrounded by pinnacles, which rise vertically at each of the eight corners of the spire, connected by a cornice at the top. This octagonal base forms an agreeable transition between the tower and raking lines of spire. The belfry windows are certainly too low down, a point mentioned by the assessor in his report; but this is a detail. Internally the roof of nave is boarded in pine, and is of the "barrel" type, divided by ribs and purlins into panels. The effect is shown in a firmly-drawn ink perspective. The external view of church, shaded in Indian ink, is rather laboured. We hope to illustrate the design shortly.

"Experto Crede," by Mr. H. Roumieu Gough, is decidedly one of the best plans. The church is well grouped, and the nave and aisles are of good proportion. The dimensions given are the following: Nave, 94ft. 6in.; choir and sanctuary, 44ft. 3in. by 23ft. 9in. wide; aisles, 10ft. in width; and there are five bays in nave. The organ-gallery is placed at the west end, and there is a baptistery at the south-west corner; and next it the tower projects independently from the south aisle. There is a long morning chapel, 40ft. 4in. by 17ft., with apsidal end, with a lobby entrance at end of south aisle. The clergy vestry is next the sanctuary on the north side, with a door communicating into choir-vestry, which latter has an independent door for organist and choir. A lobby at end of north aisle corresponds with the south one. The site plan shows that the author has duly observed the orientation, the axis of church running exactly east and west, which brings the building across the corner between the two roads. Externally the style is of an Early English character, with plain lancets lighting nave and chancel clerestory, with small coupled lancets to the aisles. At the west end the gable is pierced by three lancets. The tower and spire are of dignified proportions and height, with corner pinnacles at base which look rather heavy. The nave and chancel roof is unbroken in level throughout, which gives dignity to the sanctuary end. The plans show a knowledge of church planning and ritual arrangement. Internally the roof is of timber, with plaster between ribs of nave; there is a metal screen between nave and chancel, and the latter has a close-boarded, barrel-shaped roof. The drawings indicate stone as the material throughout.

"Lux" (Mr. H. O. Ellis) shows a plan with tower rising from centre of west end, forming baptistery below, north and south aisles with porches. The chapel projects from south aisle, and has an apsidal termination. The clergy and choir vestries are on the north side of chancel. An elaborate

coloured perspective shows a Late Gothic treatment with flat arches, and internally the roof over nave has a flat panelled wooden ceiling, with principals forming a flattish curved rib of elliptical shape, springing from wall shafts, the spandrels pierced with upright cusped openings. The drawings are cleverly executed. "Early English" (Mr. J. W. Cooksey) shows a plan correctly orientated, as in the design of "Experto Crede." The author adopts passage-aisles, with wide nave and transepts, the south one being occupied by the morning chapel, with apsidal end. The author's west elevation is somewhat spoiled by the flat-topped wings which terminate the aisles, which, with the gable in the centre, is rather uncommon. A tower and spire projects from south aisle. There is a very elaborate and artistically coloured interior, and the drawings show skilful detail and finish, but are coloured a dark muddy brown. "Experientia" (Messrs. Newman and Newman) also adopt passage aisles and wide nave; the church is rather too long in proportion. The building is of red brick; the arches are abrupt, and the spire is square in plan and of stone, springing from a rather squat tower; the nave roof is boarded, and forms a flat "barrel" shape in five bays. "San Esteban" (Messrs. Paine and Hide) is the motto of a clever set of drawings and perspective shaded in ink. The nave is 91ft. long, of six bays; a baptistery projects at the west end, and the tower rises outside of south aisle and forms porch; there is also a north porch on the other side. There is an outside entrance to choir vestry, which is desirable, and the chapel is placed on south side, with porch at end of south aisle. Two designs are submitted. Design B is of red brick and slate, and has a lead spire, rather low; while Design A represents a stone church and red-tile roof.

"St. Stephen" (by Mr. W. Gilbee Scott, A.R.I.B.A.), is an elaborate and carefully-executed set of drawings, with a plan intended to afford a large congregational area in the nave. The aisles are widened out like transepts at the eastern end; there are passage aisles and a low tower and spire at the west end of south aisle. The baptistery forms a low gabled story at the west end, and includes a porch at north side which abuts against the tower. The interior shows an arcade of segmental arches, with clerestory over, and a ribbed, boarded roof of elliptical shape over nave. The walls are of stone, and the roof-covering tile. A cleverly-tinted perspective shows a turret or large ventilator over the nave at the eastern end. Although there is ability, the details are unsatisfactory.

"Maltese Cross in Circle," by Mr. E. B. Ellis, is a very ornate design in a florid Late Gothic, with crocketed spire and other ornate details. The plan shows passage-aisles, a squat-proportioned chapel, and the east end is not well adapted. There is a flat-timbered roof, with tie-beam and ornamental braces. The drawings are artistically executed.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting for the new session of the Royal Institute of British Architects was held at 9, Conduit-street, W., on Monday evening, when there was an overflowing attendance, the visitors present including many ladies. Upon taking his seat, the President, Mr. Aston Webb, R.A., F.S.A., was greeted with an outburst of hearty cheering.

Mr. ALEXANDER GRAHAM, F.S.A., the hon. secretary, announced the deaths of several members, including Mr. H. W. Brewer, Hon. Associate, whose imaginative ability and skill as an architectural draughtsman displayed the results of his deep research and intimate knowledge of English and Continental architecture of the Mediaeval period in a manner that had given delight to architects during the past two generations. It was hoped that an exhibition of his

drawings would be held at the Institute. Other recent losses by death had been those of Professor W. H. Corfield, the eminent humanitarian, Hon. Associate; Mr. Herbert Ford, Fellow; and Messrs. Arthur Edward Bartlett and James Martin Brooks, Associates. A vote of condolence with the relatives of these five deceased members was passed in silence.

THE OPENING ADDRESS

was then read by the PRESIDENT. He remarked that as regards our membership, 97 new members have been elected during the year, and we have lost 55 by death or resignation. Of our new members 26 are Fellows and 71 Associates, and, in addition, 13 Associates have been elected to the rank of Fellow. All this, the President continued, is satisfactory, as far as it goes, but it does not go nearly far enough; and we must not be content until this Institute includes among its members all reputable practising architects, &c. at any rate, until we are satisfied that we have thoroughly investigated and removed, as far as is possible, all reasons for this not being so. One matter concerning the affairs of this Institute which must shortly be dealt with is the question of

THE ELECTION OF FELLOWS,

which, under existing rules, can hardly be said to meet the views of anybody. It is not very satisfactory to the Fellows on account of its indefiniteness and uncertainty; and it is even less so to Associates, who, not unnaturally, object to find admission to Fellowship less difficult than entrance to Associateship. And yet it is by no means easy to devise a remedy for this state of things. It is easy to say that everyone wishing to join the Institute must do so as an Associate but under our charter everyone desirous of becoming an Associate must first pass an examination, while there are, admittedly, many whom we should like to join us, who, from their age or standing, or want of leisure, could hardly be asked to submit themselves to the examination qualifying for Associateship. How is this difficulty to be overcome? The only way that occurs to me is to do as was done in the case of Associates; and fix a date, say four or five years hence, after which, except in very exceptional circumstances, entrance to Fellowship otherwise than through the Associateship is absolutely closed. The fact that this would make the Fellowship somewhat more difficult to attain would increase its value in the eyes of the profession and the public, and would, in my opinion, rather attract than discourage membership. It was distinctly so in the case of the Associateship, and I believe would prove to be the same in the higher grade. But, if this were done, it would be necessary, during the intervening period, to open the doors to the Fellowship wider than at present, so that no reputable practising architect desiring to join us should be debarred from doing so. This is a question for the members of the Institute themselves to settle, and the Council would be glad to hear a full expression of opinion on a subject that must affect the future welfare of the Institute.

THE A.A. AND THE R.I.B.A.

An event in which this Institute has taken a keen interest is the acquisition of a permanent home by the Architectural Association. It is a striking testimony to the high appreciation in which the work done by the Architectural Association is held that the Architectural Museum buildings and their contents should have been handed over to the Association as a free gift by the unanimous wish of the subscribers to the museum, accompanied by the full approval of all members of the profession. But the Association have a serious work in hand to adapt the premises to their present and future requirements, involving them in an outlay far beyond the means at present at their disposal. Your Council felt sure they were interpreting your desire to show the interest of the Institute in the work, and have voted a sum of £500 towards the building fund. The day-school so successfully started by the Association seems destined in its new premises to work almost a revolution in our architectural education (or want of it); but as I went through the spacious courts of the Ecole des Beaux Arts the other day, with their full-size models of columns and entablatures, together with examples of Renaissance and Mediaeval work, I said to myself: the Architectural Association are only at the commencement of their work; they cannot stop, but must go on, and when they have completed their schools must complete and extend their museum, and we older architects must take care

to see them through with it. It has been a pleasure to the Institute for many years to lend this room to the Association for their meetings, and we shall miss them when they go; but we hope often to have their presence amongst us, for we need the energy and initiative of the younger men. In this connection I may briefly refer to the question of our own premises, mentioned in my last address. I then ventured to express my own opinion that this question of premises, though very important, could hardly be considered an immediately pressing one; and the question of a joint building has now been solved by the gift of premises to the Association. At the same time, your Council and officers have not lost sight of the matter, and it is possible they may have some proposals to lay before you in connection with this subject later in the session.

CONDITIONS OF CONTRACT.

Another event must be noted—i.e., the adoption and issue of a form of conditions of contract, which has been accepted both by the Institute of Builders and ourselves. (It is some indication of the importance of this document, and the complicated nature of some of an architect's work outside his art, that this result has taken some eight years to arrive at.) This contract, while recognising the absolute authority of the architect over the workmanship and materials used on the works, has defined, as far as is possible, the relative responsibilities and duties of the client, the architect, and the contractor; and though it is, of course, too much to expect that any document could be drawn that would meet every case that may arise, we believe it will be found of great use to all engaged in building operations. The last Council election was made the occasion of bringing before us again very prominently the question of

THE COMPULSORY REGISTRATION OF ARCHITECTS.

As stated in a circular sent round to members of the profession, it is some sixteen years since this matter was first formally brought forward and a bill prepared; but in reality the subject was mooted by members of the Institute as long ago as 1854, and brought up in subsequent years, without, however, any action being taken. I mention these dates to show that inaction on the part of this Institute has been deliberate and intentional, and does not arise from any want of due consideration of so important a matter. For myself, I was honorary secretary of this Institute from 1889 to 1892, when the question of registration was brought most prominently forward, and thus became well acquainted with the details of the proposals and the arguments for and against them. Those arguments appear to me to remain much the same to-day, on both sides, as they were then. Then, as now, there was a considerable body of opinion in favour of the proposal, and I certainly do not wish in any way to minimise the amount of it. Then, as now, there was a considerable body of opinion strongly against it, and under these circumstances, I venture to say, the thing for the moment is outside the realm of practical politics; for any experienced politician will tell you that Parliament would never grant compulsory powers of the sort proposed, except at the general request of the members of the profession interested, and at present there can be no doubt that the profession is sharply divided on the point. I think I ought to say to you quite frankly, as your President, that personally I am not a supporter of the proposal at the present time, though I agree that the large body of opinion in favour of it cannot and must not be ignored. Evils there undoubtedly are, which should be removed; but, personally, I would try every possible alternative before applying such drastic remedies as those proposed by this compulsory registration, which, I believe, must be repugnant to every artist, whether a supporter of the proposal or not.

ARCHITECTURAL EDUCATION A FORWARD MOVEMENT.

I am reminded of a story you will probably all remember, told by the late Bishop of London at one of our dinners, of an Oxford Don leaning over a wall and watching two undergraduates trying to induce a tortoise to put his head out of his shell by holding out some tempting bait, but without result; and at last the Don quietly saying to those undergraduates, "Don't you think, gentlemen, you had better try the other end?" And I would venture to say to you, gentlemen, don't you think we had better try the other end?

If, as I think, there is no probability of getting what we all want—a higher appreciation of architecture—by legislation at the present time, would it not be better to redouble our efforts to gain the same results by raising the standard of architecture amongst ourselves, by encouraging the higher education of our young men, so that in time superior attainments may make membership of this Institute a recognised qualification in the eyes of the public, as I believe is the case already to a great extent, not only at home but in the colonies also? Professor Kerr, in a very interesting address on registration, said it was open to question whether, when this Institute started standing committees on Art, Literature, Practice, and Science, it should not have added a fifth on Education; and I think he was right. Education is everywhere the cry, and if this Institute is to take a more prominent part in architectural education, it will be necessary to depart, to some extent, from the position it has taken in this matter up to the present time. Up to the present we have been satisfied, and I think rightly so, by endeavouring to suggest a standard of architectural education by means of our examinations, leaving the preparation and education of students to others. During the last session your Council had laid before them for their consideration certain draft proposals on architectural education, drawn up by a body of well-known architects interested in this question, though not at present members of this Institute, including such well-known names as Mr. Reginald Blomfield, Professor Lethaby, Mr. Mervyn Macartney, and Mr. Halsey Ricardo. These proposals set forth the proposition that neither the system of articulated pupilage, nor the training in polytechnics and art schools, had proved satisfactory, and that a combination of the two systems was desirable; that architectural education at present suffers from want of organisation, and should be taken up by a representative body of architects—such as this Institute—which shall be accepted by the public and profession as authoritative. The proposals suggested a preliminary course of training in schools and workshops, and a subsequent course in the office of a practising architect, an endeavour being made to co-ordinate and bring into line existing institutions by the adoption, in conjunction with these institutions, of a uniform system with a central body such as this Institute at the head. This, omitting all details, which are, of course, important, gives a fair idea of the proposals, and commended itself to the Council as not only a desirable proposal, but also an eminently practicable one. The Council having ascertained that the authors of these proposals would be willing to assist the Institute in working them out, by appointing some of their number to act on a committee, the Council have appointed an education committee; and amongst them outside the Institute who have accepted an invitation to join our deliberations are Sir Arthur Rickard, Principal of London University; Mr. T. G. Jackson, treasurer of the Royal Academy; Mr. Sidney Webb, L.C.C.; Professor Perry, of the Board of Education; and Mr. Basil Champneys; while the authors of the draft proposals nominated Mr. Reginald Blomfield, Professor Lethaby, Mr. Halsey Ricardo, and Mr. Macartney. This committee has met and discussed the matter, and, with the aid of a sub-committee, has drawn up and adopted a report which is now under the consideration of the Council, and I am not, therefore, in a position to bring it before you, though I hope to be able to do so early in the course of the present session. We are encouraged to hope that we may be enabled to obtain the co-operation of the various teaching bodies in London in the scheme, and in course of time to extend our operations to the chief cities of the kingdom. We also hope to constitute a board of architectural education, bringing upon it distinguished men interested in the subject, whether members of the Institute or not, its main duties being those of an advisory board on the courses of architectural studies in the various schools and their examinations. As the scheme develops we hope to have the assistance of our allied societies, and to offer facilities to their members to participate in the advantages of these improved methods of education; and first and foremost we hope to unite in one great effort for the improvement of the education of our younger brethren, and give them advantages we sorely miss ourselves.

The President then reviewed some of the principal buildings and architectural events of the year, and proceeded to discuss

GOVERNMENT CONTROL OVER PUBLIC IMPROVEMENTS IN AMERICA AND FRANCE.

The visit of Mr. McKim last summer naturally brought into prominence American practice in matters connected with our art, and especially with the control exercised in America over public improvements, and he left in our library a book containing a report which deals with the improvement of Washington by laying it out on a large and comprehensive scale. I commend a study of this book to all interested (and what architect is not) in the laying-out and improvement of our great cities. This book recounts how a small body of experts were appointed to prepare and submit a general plan for the development of the entire Park system of the district. This committee, I understand, virtually put aside their large and profitable private work for nearly a year, and devoted their time and experience to the service of the nation, a sacrifice made without any pecuniary reward. The committee consisted of two architects—Mr. Burnham and Mr. McKim—a leading sculptor, Mr. St. Gaudens, and Mr. Olmsted, whose name is identified with what is best in garden architecture in America. For the proceedings of this committee I must refer you to their report, merely stating here that a short tour to the principal capitals of Europe was made, and then a comprehensive plan for the laying-out of Washington was produced, and laid down on the noblest and grandest lines, fully illustrated by drawings and models. The committee describe the realisation of the scheme as a stupendous task, much greater than any one generation can hope to accomplish; but they add that the hearty and intelligent co-operation with which the plans have been received by the officers of the Government, the committees of Congress, and the public generally, makes it practically certain that the development of the national capital will be prosecuted on the lines proposed. Since this was written a large sum has been voted, which will enable a substantial start to be made. Again, at our annual dinner I ventured to give some particulars of a commission appointed under the Charter of New York, composed of experts, who also act without fee, to advise in all art matters in connection with New York. This is carrying out to some extent the more complete system in existence in France, where the care of all public buildings in Paris is intrusted to (1) the Minister of Public Instruction and Fine Arts; (2) the Minister of Justice and Public Worship; (3) the Prefect of the Seine; and (4) the Prefect of Police. Each of these ministers is advised by a council, mainly formed of architects of distinction. The duties and constitution of these councils are very fully set out in a book by our late secretary, William H. White, entitled *Architecture and Public Buildings*, published in 1884, which contains a great deal of most interesting information on this subject. It is under this direction that Paris as we see it to-day has been produced, and the same system is followed all over France. As the author says: "None, having an understanding of these matters, can traverse Paris without feeling that the authority which initiates and controls the great works of architecture in that capital is a real and competent authority, to which the State turns for guidance and on whose judgment the Parisians rely." Every public building throughout France, great or small, has an architect attached to it, and, where necessary, an assistant architect, who, commencing in some humble capacity at the Council of Civil Buildings, in due time is admitted as assistant to this Board, or Council, which gives him right of presentation to a public building in course of construction, as subordinate to the architect who is carrying it out, spends his days on the works, and may rise, if he conducts himself well, to be assistant architect or joint architect to a building, and ultimately architect-in-chief. In course of time he is summoned to take the place of councillor on one of the various Boards, and ultimately the Academy of Fine Arts, who educated him, will hear of him again, and finally elect him to their body. Thus the State not only assists in providing an efficient system of architectural education, but also provides itself with an efficient body of trained architects to undertake its public buildings, all working on a well-defined tradition, and producing works of great excellence, which we cannot but admire. I do not propose to compare these systems with the course adopted in this country, partly because you are all well aware what that is, and also because I am afraid the comparison

could hardly be in favour of this country. Not that I mean for a moment that the French system in its entirety would be suitable here; it tends no doubt to a loss of individuality, which would hardly be tolerated here, for though we talk a good deal of working on traditional lines, I am not sure whether we have yet learnt the lesson of sinking our own individuality sufficiently to do so.

WANTED, AN EDILE OF PUBLIC BUILDINGS.

I have mentioned these systems in force in France and America to draw attention oncemore, as I ventured to do last year, to the pressing need there seems to be in Great Britain; and which, I think, most of us feel, for some authority to whom schemes of public improvements should be submitted, not necessarily for sanction, but for consultation and advice. The work could hardly be intrusted to any single individual, but there would surely be no difficulty in finding men of skill, taste, and authority enough, and with patriotism enough, to form such a commission as that established in New York, and on the same terms, if asked to do so by His Majesty's Government. The public are singularly apathetic in the matter. We have so long preached to them the beauty of old work that they have apparently taken our view and regard modern work with comparative indifference. They resent, and no doubt in many cases rightly, the least interference with ancient buildings, but treat with unconcern the vast modern changes now taking place in our cities.

THE STUDY OF THE PAST,

invaluable to the student, delightful for instruction, and refreshment to all of us, must not take the place—for us at least—of the all-absorbing present and future. Last century was spent by us in research and retrospection; let us now show the result of our studies and spend this one in action and progress. Let us see that our buildings are beautiful, as beautiful as we can make them, and with a beauty that tells of our time—not original, perhaps, but at least distinctive; let us see that they meet the present complicated requirements, that they are well placed for sun and air, cheerful, wholesome, gladdening; that we put something of ourselves into them, in order that they may give out something to others, and let us remember how great a responsibility rests upon us architects in our work. Ruskin, addressing the Architectural Association, once said: "What a peculiar importance and responsibility are attached to your work when you consider its permanence and the multitudes to whom it is addressed. We frequently are led by wise people to consider what responsibility may sometimes attach to words which yet, the chance is, will be heard by few and forgotten as soon as heard. But none of your words will be heard by few and none will be forgotten for five or six hundred years, if you build well. You will talk to all who pass by; . . . all those little sympathies, those freaks of fancy, those jests in stone, will occupy mind after mind of utterly countless multitudes long after you are gone; you have, not like authors, to plead for a hearing or to fear oblivion. Do but build large enough and carve boldly enough, and all the world will hear you; they cannot choose but look." Let us, then, resolve that we will go straight forward, adding our little something to the great story of our noble art.

Guests of the ages at to-morrow's door.
Why shrink we? The long track behind us lies,
The lamps gleam, and the music throbs before
Bidding us enter; and I count him wise
Who loves so well man's noble memories:
He needs must love man's nobler hopes yet more.

LORD WINDSOR, the First Commissioner of Works, in moving a vote of thanks to the President for his remarkable and suggestive address, observed that Mr. Aston Webb had dealt with matters which did not affect that Institute alone, but very deeply affected the welfare and amenity of the whole population of the kingdom, who had their own share and interest in the architectural appearance of our great towns and cities. With reference to the advantages and importance of having some recognised body of competent persons who would advise those responsible for obtaining designs for great public buildings in this country, he did not doubt for one moment that the artists who were foremost in all branches in this country could not hesitate to give their services to the State for such honourable work, and there were few of them who could doubt that London in the past had suffered terribly from the want of a broad view of what the designs should be which should regulate the chief architectural works which

should make the Metropolis a magnificent city. The instances of what was being done at Washington by the foremost architects of the United States, who were gladly giving up their time and abilities to help the Government in a great work without applying to the treasury for any expenditure in aid, was a very practical illustration of what could and should be done. He expressed his absolute sympathy and concurrence with the words of the President when he hoped that an advisory body of competent persons should have a voice in the laying out on a large scale of the streets and buildings of London. If the views of the President were those of the Council of the Institute, he should gladly undertake to lay them before the Government, and whether it might be possible that anything would be done or not for some time at least, no time would be lost in having them fully considered. London had suffered terribly in the past from the lack of a broad view of what the designs should be which should regulate the chief architectural works, and make our great Metropolis magnificent. Surely all felt now that if the designs and the plans for dealing with Whitehall had from the very inception of the Public Offices been laid out on broad lines with a really fine scheme, a most magnificent approach to the Houses of Parliament would have been secured. The blame surely did not rest upon the architects employed, but upon those who employed them. As regards the trees planted in London along the streets, his personal opinion was that we were rather too much afraid to prune down. He had seen from letters in the newspapers that there was an idea that His Majesty's Office of Works were going to make a new road right across the Green Park. That would be a very important new work, which could not be done until it had been sufficiently considered, and which would not be done surreptitiously. So far as he knew there was no intention—certainly not in connection with the late Queen's Memorial—of cutting a new road across the Green Park.

MR. HENRY T. HARE, President of the Architectural Association, seconded the vote of thanks, remarking that the address had been concise, clever, and instructive. Into the question of registration, which had been dealt with most exhaustively, and which was still a burning one among architects, he did not propose to enter. Strong arguments had been advanced against the Registration Bill, but there could be no doubt that the state of affairs which had awakened this agitation for registration was a lamentable one, and, personally, he felt much sympathy with those who had promoted the Bill, although he was not in entire accord with that measure. The most important topic broached was the question of the control of the design of public buildings—one of the most serious questions in all large cities. It was highly gratifying to hear that the First Commissioner of Works had accepted and endorsed the proposal; and he was glad that a man of such broad and sympathetic feelings towards art as Lord Windsor should have been placed at the head of that department. No one who had travelled much could fail to realise the different attitude of the Government towards architectural art in this country as compared with that manifested in France, Germany, and the United States. A broad-minded scheme of improvement was, in the long run, the most remunerative, as Paris had proved during the past generation. As their most distinguished Past-President, Mr. Aston Webb's sympathetic allusions to the educational work of the Architectural Association must be highly gratifying to all its members. The Institute and Association had for years been drawing into more intimate relations the one with the other, and it was possible that the A.A. day-school, under the new conditions, might ultimately supersede the present pupilage system.

MR. REGINALD BLONFIELD supported the vote of thanks, remarking that he could not agree with Mr. Hare that the control of public buildings was the most important topic of the day, but the education of the young architect. The day-school system, so successfully instituted by the Association, needed to be supplemented by the training of the student in an architectural workshop, or rather laboratory, so that the future architect should understand the capabilities of the materials he was to specify, and be given opportunities for research into constructive problems, a point that had been practically disregarded since the days of Wren.

The vote of thanks was carried by acclamation, and was briefly acknowledged by the President.

REINFORCED CONCRETE.

A NOVEL mode of reinforcing concrete beams, lintels, and window-heads is described by Mr. Julius Kahn, C.E., Assoc. M. Am. Soc. C. E. The author speaks of the value of vertical reinforcement for beams, as we find it introduced in the Hennebique system. This is evident from the failure by shearing at the ends. The writer has made several tests on beams reinforced with plain and deformed rods on the bottom, and without exception, all such beams, when tested to destruction under uniform loading, failed by vertical or longitudinal shear in the manner pointed out by Captain John S. Sewell. The article to which we refer, printed in the *Engineering Record*, has diagrams showing lines of tensile stress, which is one of variable curvature from bottom of beam to the top—a theory advanced by the late Professor Rankine. Diagrams are given showing the truss action in a beam, flat arch and lintel, and the method of introducing the steel rods. These lines of tensile stress indicate the principle of reinforcing the beam. Being weak in tension, a concrete beam would open at right angles to these lines, which had actually occurred in the tests. The stirrups introduced by some engineers are very useful, as they cross the lines of rupture at an angle, and tend to hold the material together. They should, however, be placed on a beam in a direction inclined to the horizontal, so as to lie close along the line of principal tensile stress, for they then cut the line of rupture at right angles, and therefore assist to hold together the concrete where it has a tendency to open. The fundamental principles of this type of reinforcement are stated:—(1) "Concrete should be reinforced in a vertical plane as well as a horizontal one; (2) the reinforcement should be inclined to the vertical preferably, with varying upward curvature approximating the line of principal tensile stress; (3) the metal should be distributed in proportion to the strains existing at any place; (4) the shear members should be rigidly connected to the horizontal reinforcement steel. The author has tried to accomplish these results by taking a bar of square cross section, placed diagonally, and shearing upwards into an inclined position, the web on both sides of the main bar thereby forms substantially the tension members of the Pratt truss. When such a member is imbedded in a body of concrete the latter unites firmly with the steel, and the combination of the two forms a trussed beam wherein the tensional members are of steel, and the missing compression members supplanted by the concrete." But we leave the reader to study Mr. Julius Kahn's remarks. One sentence may be quoted as conveying the principle in a practical manner:—"As soon as a load is applied on top of the beam, the concrete tends to arch itself, and a series of internal arches immediately set themselves up within the material, each arch finding its abutment in a set of prongs, for which the bottom chord acts as a tie. The prongs receive the weight, and carry it upwards, distributing it on the other arches of larger span, the horizontal reinforcement serving as a common tensional member." This tensional member may practically be placed outside the concrete, the strain it receives being largely the horizontal components of the inclined members. Several photo. illustrations show the trussed beams for testing and the failure of concrete-steel beams, with longitudinal rods only and trussed in the way described. The subject is one of great interest to all engineers and architects engaged in reinforced concrete. The theory is the same as that involved in a trussed beam, and the introduction of steel bars to take the stresses which theory has propounded will enable the architect to design forms of concrete capable of carrying heavy loads. We are yet only at the threshold of this mode of construction, though the principles are clear.

THE BACTERIAL TREATMENT OF SEWAGE.

AT a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, Nov. 2, 1903, Mr. J. Patten Barber, President, in the chair, a paper was read on "The Bacterial Treatment of Sewage," by Mr. George Thudichum, F.I.C., F.C.S., and of which the following is an abstract: The author prefaced his remarks by stating that the extensive experiments which had been carried out during the last seven or eight years by various authorities had yielded results very

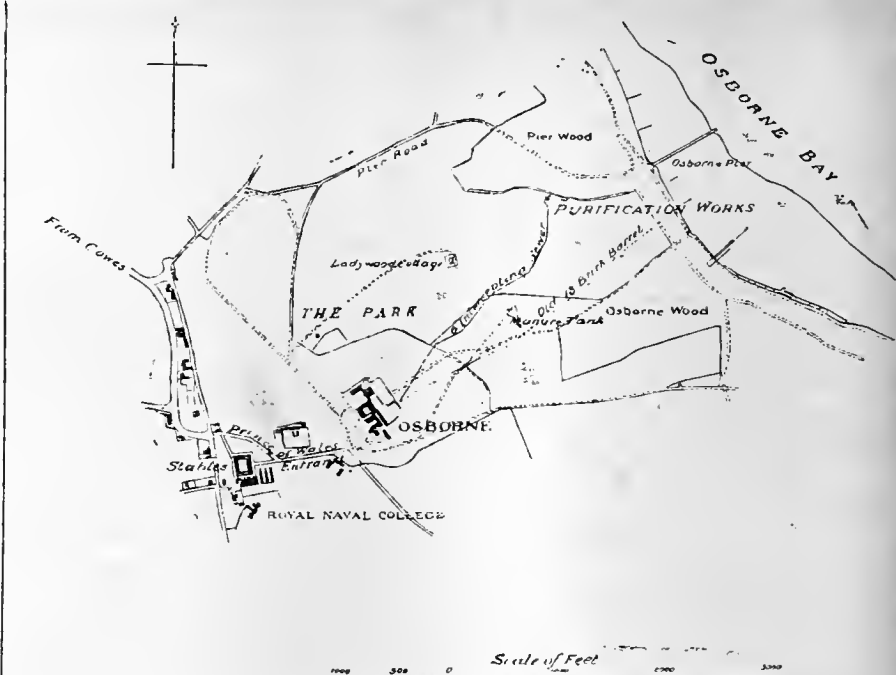
gratifying to those who had first introduced bacterial methods. The principle that sewage could, in the large majority of cases, be purified by biological means alone had now found practically universal acceptance, that being indorsed by the Interim Report of the Royal Commission now sitting. He pointed out that, that being so, there was no longer any need to argue as to principle, but the best methods of application might still be discussed with advantage. The two main points which were still being argued were (1) the relative merits of the anaërobic or septic, as compared with the aerobic, or coarse-grain contact system; and (2) the various ways of applying the effluent, from the preliminary treatment to the finishing filters.

The author then proceeded to discuss the first point, and after setting out the arguments *pro* and *con*. at some length he finally gave it as his opinion that the anaërobic process was more in accordance with the teachings of nature, and, moreover, possessed certain specific advantages over its rival, such as the averaging of the sewage flow, the greater ease with which regular periodic working of the filters could be obtained, the absence of trouble from loss of water capacity through deposition of solids, and the easier and cheaper cleansing, if necessary. The necessity for covering a septic tank was then dealt with, the author stating that he thought it desirable, since it prevented disturbance of the bacterially-active scum, avoided risk of nuisance, and enabled use to be made of the gases evolved during the putrefactive process, as was actually done at Exeter. As regarded the question of the best method of applying the primary effluent to the secondary beds, the author hesitated to express an opinion, since excellent results had been obtained by either method, and the evidence available was not yet sufficient to enable a definite verdict to be arrived at.

The author then discussed the question of sea outfalls, and the possibilities of pollution of shell-fish by sewage or sewage effluent. He thought that in some cases the standard demanded was too high, and suggested that reasonable safety was all that should be asked for, since absolute safety was practically unattainable. The author concluded by pointing out how the present methods of sewage treatment had been gradually built up, tracing the growth of the so-called Sutton system from its early commencement to its maturity.

SEWAGE DISPOSAL AT OSBORNE.

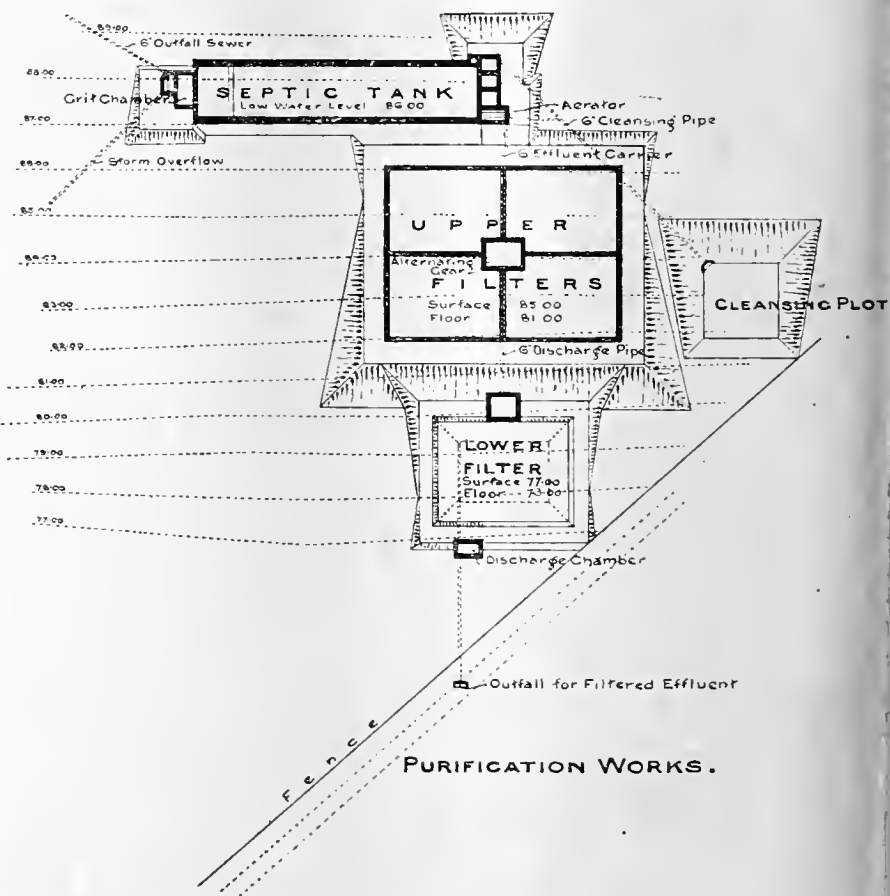
THE progress which sanitary science has made during the past half-century is well illustrated by the contrast between the drainage arrangements which were in use at Osborne down to a few months ago, and those which have been installed in connection with the establishment of the Royal Naval College, which was opened by the King in August. The late Prince Consort did much to draw attention to the need for proper means of dealing with sewage, and it is certain that on the building of the Royal residence at Osborne (close on sixty years ago), the drainage of the house received its due share of attention at his hands. It may, therefore, be taken as representing the latest development of sanitary science at that time. It is hard for the drainage engineer, amid the profusion of excellent sanitary appliances at his command to-day, to realise under what conditions his predecessors had to work in the year of our Lord 1843. In those days, be it remembered, stoneware pipes were not known. The main outfall drain, by which down to the last month the whole of the sewage of Osborne was carried off, is an 18in. barrel built of common bricks. It is comforting to reflect that the gradients were good, and that the outfall drain was effectually trapped off from those around the house. The sewage was originally discharged into the sea, but was subsequently intercepted and diverted by a pipe-drain into what was known as the "manure tank." This tank consisted of three compartments, built end to end, each being 15ft. long and 6ft. wide, and containing two tiers of wooden gratings, on which a layer of sandy soil was spread. The sewage was admitted at the bottom through a 9in. pipe, and rose successively through the three compartments, in which the solid matter was retained. The clear water rising to the top of the tank was carried off by a pipe which ran on a contour around the hill, and eventually found its way to the surface through a series of "weep" pipes. This system, with slight variations, is in use to-day at scores of



mansions throughout the country, and previous to the discoveries of the last few years a country gentleman had no better means at his command for disposing of the sewage of his house. The works appear to have met the requirements of the time fairly, the long absences of the Count from Osborne having afforded the land the rest which it needed between successive dosings with the sewage.

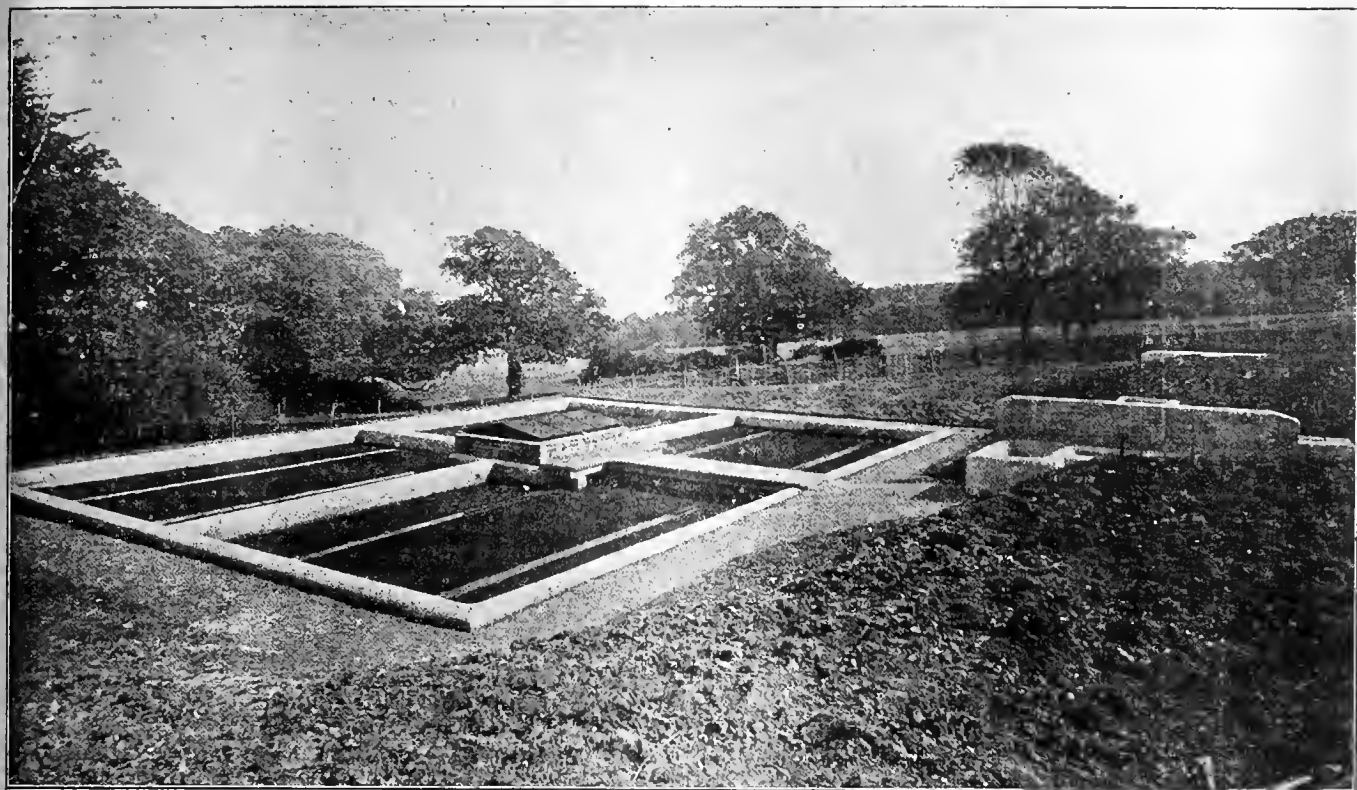
Such was the state of things down to the

drainage of the College and the overhauling of the drains of the house being entrusted to Messrs. Doulton and Co., of Lambeth S.E. The work of construction was put in hand towards the middle of June, under the direction of Mr. E. G. Rivers, M.Inst.C.E., chief engineer of His Majesty's Office of Works. The Septic Tank Company's operations commenced at the intercepting chamber immediately in front of the house at the head of the brick-barrel above



spring of the present year, when, in view of the large addition which the College was expected to make to the resident population, His Majesty's Office of Works decided to lay down an up-to-date system on a scale commensurate with the work to be done. The Septic Tank Company, of No. 1, Victoria-street, Westminster, S.W., was accordingly called in to deal with the sewage, the

referred to. From this point a new 6in. sewer with gradients of 1 in 75, 1 in 34, and 1 in 24 was laid in a north-easterly direction to the position chosen for the purification works. The sewage is thus carried out of the valley running down from the house to the sea into another small valley to the north thereof, the site occupied by the installation being close to the southern margin



SEPTIC TANK INSTALLATION FOR OSBORNE HOUSE.

of the Pier Wood, about 400 yds. above high-water mark.

The purification works, which are shown in the accompanying plan, comprise a covered septic tank and four aerating bacterial filters, all built in concrete, and a single low-level filter formed in the ground. They are designed to serve 550 people, and to deal with a wet-weather flow of 33,000 gallons per day. As is usual in the Septic Tank Company's installations, storm flows exceeding this rate, but of short duration, will be wholly dealt with in the purification works; but

inlets into the septic tank, which is 55 ft. long by 10 ft. wide, and 6 ft. in average depth below the springing of the roof arch. The effluent is withdrawn by a submerged slotted pipe into the effluent-chamber, from which, ample fall being available, it passes over an aerator on its way to the high-level filters. Each of these is 22 ft. long by 16 ft. wide, and is filled to a depth of 4 ft. with furnace clinker broken to gauge and freed of dust. They are filled and emptied in the original Exeter cycle, each filter in turn remaining full while the next is being filled. The work is automatically controlled by the company's central basin gear, which, as shown by the photograph, is entirely self-contained, and therefore beyond the possibility of derangement by errors in setting the various parts.

As the effluent from the purification works will during the greater part of the year constitute the whole flow of the ditch which receives it, and will run down over the beach into the sea, it was decided to subject it to a second filtration. A low-level filter, 20 ft. by 20 ft., at the surface and 1 ft. deep, has accordingly been laid down, and the effluent from the upper filters, after passing through a receiving-chamber which takes up the first rush of the discharge, is showered on to it from two lines of perforated cast-iron pipe. The alteration in the spread of the jets, due to the variation in the head on the orifices, enables a good distribution of the effluent to be secured with fixed distributors—an important advantage in a small installation, where the flow cannot be relied on to work a rotary distributor satisfactorily. The effluent from the lower filter passes down a slope of white glazed bricks into a ditch close by.

The structural work has been excellently carried out by Messrs. Smyth, White, and Co., Ltd., of 25, Victoria-street, Westminster, S.W., under Mr. A. Thomson, the resident clerk of works at Osborne, and the installation is in every respect a good example of an up-to-date sewage purification works.

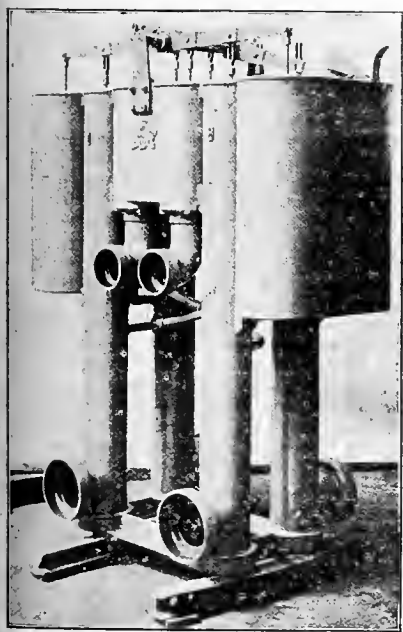
ELEMENTARY NOTES ON THE SUPERVISION OF BUILDINGS.*

By C. F. INNOCENT.

ALTHOUGH I believe some architects consider the supervision of buildings rather beneath them, it is, in my opinion, very necessary if the buildings which the architect designs are

* A paper read before the Sheffield Society of Architects.

to be carried out in accordance with his ideas, and without such supervision variation either by accident or design is inevitable. While we have in Sheffield many tradesmen who may be trusted to carry out work both honestly and well, and who would prefer to do good work rather than bad, the present system of adopting the lowest tender is an inducement to contractors to obtain work by cutting prices, and profits have then usually to be made at the expense of quality in the work; of course, in some cases the builder may see various ways of cutting prices without lowering the standard of the work. It is with inferior builders that this paper is chiefly concerned. Let me urge upon any pupils here the importance of getting on to works in progress as much as possible, as this is the way to obtain a practical knowledge of construction: textbooks and building construction classes are all very well for obtaining theoretical knowledge; but they leave untouched a great many matters upon which you will have to be informed if you are to make efficient superintendents of buildings. If your principals would allow you to visit a building from the commencement to the completion—say, every day or every alternate day—to act, that is, somewhat as “clerks of the works,” you should be greatly benefited, provided, of course, that you have kept your eyes and ears open. It will greatly help your understanding of the working and detail drawings, which in their varied colours appear at first so incomprehensible, if you go over the building with them, and study their relations to each other. The person with whom you will have most to do while on the works is the foreman, and it is well for you to remember that he is placed in his position by the builder to look after his (the builder's) interests. One way in which he can do this is by a pleasant and obliging—sometimes only apparently obliging—bearing towards the architect and his staff, and you will usually find the foreman very easy to get on with. Much useful information can be learned in conversation with an experienced foreman, and also with the better class of workmen, such as the joiners who are “staircase hands” and the masons who set the ashlar. And the conversation of workmen among themselves is quite as informing, though in a different direction. The workmen are usually pleased to have their work noticed; but you will hear curious ideas from some of the men, and have to exercise your powers of discrimination. Your interest in the work, if pleasantly shown, will benefit both yourself and the building, and I think it quite allowable for you to help the builder in various



AUTOMATIC ALTERNATING GEAR.

in case of a continued heavy downpour the surplus will escape over a fixed weir. The main outfall sewer discharges into the grit chamber, which is 6 ft. long by 3 ft. wide and 3 ft. deep. From this chamber, the sewage, which is not screened in any way, passes through two special submerged

little ways, without laying yourself open to charges of collusion with him, such as by pointing out a workman who is slack, or by suggesting an improvement in the length of the ladder or barrow runs. If you should be set, as I have advised, to look after work, the foreman will soon take your measure, and if he thinks you are a likely fellow for it, will try to persuade you to alter all sorts of things—of course, to improve the work. Such, for instance, as the benefit to be derived from the substitution of lia lime for cement in concrete, and if you are green enough he may make such substitutions without saying anything to you about them. Things will go more smoothly if you always stick pleasantly and firmly to your first decision. If you know that you are right, take no notice of the builder's objections that such-and-such ways are unnecessary fads, and that Mr. So-and-So always has it done in some other way. Everyone hates shilly-shally and indecision as to how things are to be done, and more particularly so in the disapproval or approval of work and materials. You will find it best to show at the beginning that you mean to have everything done well. Whilst on the subject of foremen, I would remark that some builders have an inconvenient habit of moving their foremen about from work to work. This will cause you a great deal of trouble, and should be objected to. In condemning materials you will, of course, order them to be removed from the site, and if you are wise you will see them go. Unless this is done it is so easy for an unheeding workman to use up the stuff—of course, quite by accident. If you do not see them removed, you should, at any rate, thoroughly remember their appearance, and, if possible, plainly mark them as disapproved. Perhaps I can best illustrate what I mean by an anecdote. A Sheffield architect had to build a wall round what may be called a place of worship, and determined to make a good job of it by specifying Greenmoor stone coping. The builder, however, substituted a much cheaper and softer stone, in which there are patches of a lighter colour. He then sent for the architect to approve the work. However, instead of approving he disapproved, and the builder admitted that it was scarcely up to the usual quality of Greenmoor, and he promised to get a fresh lot of better quality; but when the architect had gone the patches were cut out and the old coping duly refixed. Again the architect was sent for, and was pleased this time to express his decided approval. The builder was paid for Greenmoor, everybody concerned was satisfied, and what more could be desired? That builder has now retired with the reward of his commercial enterprise, but the architect is still in practice amongst us. This story was told to me by a foreman, and it is significant that he looked upon such "extremely dexterous" conduct as a good joke! I believe that some undesirable builders consider that the disapproved material is removed if placed upon another part of the site. At least, I have heard a tale which implies this, concerning a Sheffield architect, whose large and successful practice was only ended by his death. He condemned a quantity of timber on a building, and ordered it to be removed away; but the builder took counsel with the clerk of the works, and annointed him with palm-oil. The timber was then put on another part of the site, the stuff was sorted according to quality, and the worst carefully put at the bottom and the best at the top. When the architect next came round, the clerk of the works pointed out the excellence of this new timber, and the architect approved of it as most desirable stuff! But all this happened years ago, and we know that with other men come other manners. When the builder assures you that the materials are the best, he may be correct in the letter but wrong in the spirit, as "best," used as a trade term, does not always bear its recognised dictionary meaning. The "best" in some materials may be of quite medium quality. I hope that it is not necessary to warn you against ever taking anything from a tradesman which malice or suspicion may interpret as an illicit commission. I would carry this to the extent of not allowing your tram fare to be paid, small as that is. The position of the architect is such that he cannot be too careful of his conduct in such matters. If you have to do with builders in the country, where manners are (shall I say?) more unsophisticated, they will possibly invite you to accompany them to the nearest publichouse. I trust that you will risk offending them rather than do anything so unprofessional. While I am speaking about the country builder I

would remind you that you will hardly obtain workmanship from him with the finish that you expect here in town, although the work may be substantial enough. This is because the best workman will not work in the country owing to the low wages and so-called dullness. In work out of town where the builder is unable to drop into the architect's office whenever he wants to ask a question, it is almost a necessity to adopt a regular day for inspection or to inform the builder beforehand of your visit, and I believe that some architects adopt this practice with their work in town; but it is in such cases, in my opinion, of questionable utility, as it always enables the builder to have everything on the work ready for your inspection as he wishes you to see it, and it has the disadvantage also of allowing the large force of men whom he has put on the work to gladden your heart on your visit of inspection to be transferred to another job when you are safely out of the way for a few days or so. Visits at all times and any time are the best way to keep everyone on the *qui vive*. You know that as soon as the labourer, who is mixing mortar or loading up bricks in the road, sees you bearing down on the job he goes inside and shouts up to the scaffold that so-and-so, whatever your name or your nickname may be, is coming; the word is passed round, and by the time that you have climbed upon the scaffold the bricklayers who have been laying the bricks nearly dry, except on the face joints, are laying them as carefully as eggs; and the masons who have been packing their walls with little stones without a scrap of mortar to cover them have flushed them all up in what seems a most satisfactory manner, until you poke into it. It is, I suppose, natural to everyone to go the easiest way, and you will have an early example of this when the stripped soil of the site has to be tipped. You will find most excellent reasons produced for wheeling it down-hill. I think when you pay a visit to a building for the purpose of supervision, that it is as well to go round by yourself, and not be led round by a talkative foreman. In such a case I sometimes feel that work is being smothered up on another part of the building while he is engaging me in conversation. Of course, it is a different matter if you go to learn what you can from him, as suggested before; and I may say here that it will be as well to ascertain from your principal what is your standing on the work. No doubt you will realise that the condemnation of work or materials by an inexperienced pupil sometimes places the architect in a position in which it is necessary to let the pupil down. It is obviously impossible for me here, even if I had the knowledge, to describe the numerous probable defects in the various works and materials in a building, and it is done far better in such standard works as Seddon's "Builders' Work and the Building Trades" and "Notes on Building Construction." There have also been various excellent series of articles in the architectural papers. There is one point, however, which I consider does not meet with adequate consideration in the textbooks: that is, the correct order in which the different trades and operations follow each other. These are known well enough to the builder; but he does not always act up to his knowledge, but sometimes, if permitted to do so, only considers his own convenience. For instance, he may build the walls in one part of a building before those in another part, with unequal settlement as a possible result, or he may rush the concrete floors on while a shower of sawdust is descending from the joiners' working at the roof, thus weakening the concrete; or the joiner may bridge or strut the joists as soon as they are fixed, so that the fastenings are strained with each swelling and shrinkage of the timber, or a labourer with nothing to do may be set to sweep up the rubbish while the painters are varnishing, thus producing a fine frosted effect without extra charge; or various works may be delayed, perhaps, in the hope of slipping them altogether. On the contract work each tradesman usually wishes to change his men about as little as possible, to keep them at regular work, and to go straight forward, and get as much work finished as is possible at one time. I will now run through such other matters in the work requiring your attention as occur to me. As to the commencement. Some architects set out the work themselves, and others refuse to do so, but check the dimensions over after the builder has set out. This is necessary, because you will understand what a saving an unscrupulous builder would effect if he were to pinch 2½ in. or 2 in. from each dimension of each room.

The rooms should also be tested to see whether they are square. Whether the walls are at right angles may be easily tested with the measuring-tape, if you remember that the sides of a right-angled triangle are in the proportion of three, four, and five, and, of course, their multiples. The heights of the rooms should also be tested as to their correctness. You are not likely to be troubled much in Sheffield with bad foundations, though here and there there are quicksands. The pump and concrete are a necessity in such cases. We have, however, plenty of clay in Sheffield, and as it is liable to swell with wet and contract when dry, with unpleasant effects to the building, you should have the "footings," as they are called, got in before rain gets to it. If the "footings" are of rubble it is necessary to see that they are well bedded on the foundations, and well compacted together. Poor footings lead to cracks in the superstructure afterwards. While speaking of the foundations, I would remind you that they are occasionally omitted in places where the building inspector can be squared, or where the building inspector has not yet put in an appearance. I recently had to inspect a house in the South in which the builder had omitted the foundations. But the value of foundations is somewhat exaggerated, as the tower and spire of Rotherham Church stood for about four centuries practically without foundations. In any case you should be sure that the foundations are of a proper depth, and keep a memorandum of it. When the drains are laid the labourers very often start to ram the filling as soon as the first portion is thrown in, with cracked pipes as a possible result. This should not be allowed. It should also be seen that pipes are clear inside, especially from cement ridges: in places where there is much filling, water from a hose may be used with advantage to supplement the rammer. The mortar is a most important ingredient in a building, and as the builder naturally dislikes to waste any, the spare mortar a day or two old very often is reworked up and used in the work; as its setting powers are thus impaired, this is not satisfactory, and you should watch and prevent it: good mortar ought to feel greasy between and dry limey on the fingers. A builder's rough test for mortar is to take some up on a shovel and turn the shovel over; if it runs off easily he considers that it is of good quality, and *vice versa*. Poor mortar which, owing to the too great proportion of sand, works stiff, is wetted in practice to make it work more easily, and it is then deceptive. The waller finds mortar with poor sand—that is, loamy and clayey, most easy to work with. The lime used for mortar should be in lumps, which ring when struck together. If it is soft or fallen into powder, it has probably been rained upon or slaked by the moisture in the atmosphere, and should not be used for mortar. In mixtures where lime or cement is an ingredient there is a tendency, owing to the greater proportionate cost of these materials, to put in a less quantity than specified: and whether you have doubts or not, it is advisable to personally watch over the mixing; especially of concrete, where the strength may be of importance. The proportion of cement may be reduced under your very eyes by the labourers putting the box for measuring the cement on to the heap of stones and sand and knocking it down, thus forcing some of the stones up into the measuring box and reducing the amount of cement. Mortar should not be allowed to set, or rather to dry, too fast, and in hot weather the bricks should be well soaked in water; such a wet brick is heavier and harder to the bricklayer's hand than a dry brick. Concrete is also not improved, but the reverse, by drying, as may take place with floors in windy weather, and such concrete should be kept damp until it has set. You will, of course, see that the bricks are properly bonded, especially at angles, in reveals and jambs, and in piers: a well-bonded brick wall is much more satisfactory in appearance to the eye than one in which the joints are not perpendicular and the bricks are cut about. In this respect the old 18th-century brickwork, where the piers and openings are all multiples of a brick, is superior to much modern work, where the piers and openings are set out on a drawing to a scale of feet and inches, and the bricks have to be cut to fit it. In the walling of flues there is a matter which ought to be carefully attended to: I mean not to "throttle" them, as the builders say, as this is one of the most usual causes of smoky chimneys. Particular attention should be paid to the flues at the bends, to see that they are kept large enough. As the necessary

bends themselves impede the smoke, you should see that the men in walling do not make them smaller at the angles, as they have a habit of doing. Interior workmen are very careless about keeping woodwork or steel joists properly away from flues and fireplaces, and as many fires are due to this cause, you must carefully guard against it on buildings over which you exercise supervision. There are still builders in this district who lay the joists, then build the flues around them as they come, and afterwards the pieces of joists which run across the flues are cut off, leaving the ends of the joists exposed. The defective filling in of the backs of stoves, and careless springing of the flues are other frequent causes of fires, and should be avoided. You will have learnt that stone should be laid in the work upon its natural bedding plane—"quarry bed" as the builders call it. Much of the building stones used locally are somewhat micaceous sandstones, in which the tiny white mica spangles are bedded parallel to the plane of deposit—i.e., the "quarry bed." If this is not possible, a good way of ascertaining the bed of a stone is to douse it with water. The beds worked by the mason require your attention to see that they are level, and of full size; otherwise pieces may flush. It is rather expensive and troublesome sometimes for a builder to replace a piece of ashlar which has got chipped or otherwise damaged, and it is possible for him to patch it up very neatly and inconspicuously with cement, and I understand that very up-to-date masons stick the chip on with shellac and sand the joints, all with unfortunate results later on. You should keep your eyes open for this. Some inferior builders, in order to save scaffolding on the work, only put it up on one side the wall. This necessitates what is known as walling "overhand," and should be objected to, as it is almost impossible to plumb up the work properly. Of course in some cases this one-sided walling is necessary. You should regularly plumb the walls, as walls out of plumb are unsightly and may be unsafe, and are impossible for the joiner and the plasterer to make a good job of. Another point to guard in walling is to see that the scaffolding is raised in easy stages for the wallers. Some men neglect this to the detriment of the walls. These are little ways in which the builder may effect savings, which keep money in his pocket, and add, of course, to his balance on the right side. Other such occur in all trades, as in the Carpenter for instance, as giving all the bearing timbers, as lintels, an inch or so less of bearing at each end, or by making the roofs of a flatter pitch than shown on the drawings, which is an easy dodge in a hipped roof, or by setting the joists of wood or steel an inch wider apart than taken, or by systematically omitting one joist in each room;—such omissions all add up. I remember a building on which I counted the joists, and found that the builder had effected a considerable saving by systematic omission in this way. However, his ingenuity was duly noted at the settling up. You ought to see that the amount and quality of work required by the contract, for which your principal's client is paying, are put in the building, and more particularly in those parts which will afterwards be hidden, such as the foundations and the correct number of the ceiling joists and spars. It is quite possible that a bill for extra work in such inaccessible places may arrive at the conclusion of the work, but the question of payment for extras is beyond the scope of this paper. The ordering of extras is important, and I must warn you to be careful of what you say, as builders sometimes put their own interpretations on your innocent expressions of opinion, and when the bills come in, and your principal asks the builder who ordered such and an extra, the builder, looking in his pocket-book, says: "Oh, your Mr. So-and-So ordered on such a date." The result may be unpleasant all round. It is best for the builder to understand that the architect alone can order extras. I have previously pointed out the importance of seeing work carried out, and I would here point out the importance of getting round the builders' shops, in addition to the building itself, as without a good acquaintance with workshop practice you will hardly be able to draw workable details. I have seen sections drawn for local sandstone, which could only be worked in wood, or perhaps in marble, and every builder has tales of impossible details which came out of architects' offices. Not only are such visits to shops desirable for the acquisition of knowledge, but they are necessary in the case of joinery, as

the first coat of paint, known as the priming coat, is usually put on in the joiner's shop, and all kinds of defects may be covered up if not seen before being painted. The principal points to notice in the joiner's work at the shop are the quality of the timber (especially as to sap and seasoning), bad joints, and the omission of labour, as in grooving and rebating, and to see that the framing is square and not winding on its faces; and, if detail drawings have been used, to see that the work as regards mouldings, framings, panels, &c., has been carried out in accordance with them. The quality of timber gets poorer as the years go by, and as the old forests round the Baltic are cut down, much of the inferior stuff, with its large annual rings, quickly grown in a crowd, and, therefore, soft, which is now sent over, is no doubt inevitable. But it hardly justifies the sweeping statements of some joiners that there is no good wood to be had nowadays. They may be reminded that there is as good fish in the sea as ever came out, if they care to buy it. The BUILDING NEWS has lately had an interesting series of articles, illustrated by sections of random samples of various timbers with the sapwood blacked in. The places where things are most likely to be forgotten, as I will put it, are those which are dark and difficult of access, more especially the roof. I would urge you to climb up and see whether the spars and purlins, and the other timbers are all properly spiked together. There is a roof into which I had occasion to climb up some little time ago. It has a ventilator on the ridge, and the rooms underneath have ventilating doors in the ceilings; but there are no connections between the doors and the ventilator. A little wholesome exertion on the part of the architect would have rendered this impossible. Careless supervision, like murder, will out, sooner or later, so that it is to your own, as well as the client's, interests in the long run to see that all is right. A client usually notices things which, though structurally unimportant, render, if not rightly built, the "very very pretty house" desired by some people, unobtainable, and they should be carefully attended, however small they seem. Examples of such points are the qualities of paint and varnish, the centring of fireplaces and windows in walls, the fitting of window sashes, and the squareness of joiner's work, irregularity in which interferes with the correct fitting of wallpaper patterns. In setting out, joiners work up to eighths of inches, but consider sixteenths of inches as infinitesimal. Bricklayers and masons do not expect to take into consideration less fractions than half-inches. The roof coverings require careful watching if you mean to have a satisfactory job made of the roof, and I have somewhere seen that an architect is never forgiven for a smoky chimney and a leaky roof. Slates from the better-class quarries have not been very easy to get hold of lately, and, unless you early bestir yourself, you may be driven to accept inferior slates. Of course you will understand that with materials that have to be obtained some time before they are used in the building, there is sometimes a likelihood, owing to financial reasons, of the builder using them for other jobs before yours is ready for them, and this, unless prevented, may prove awkward for progress and good building. If the slates are to be to sample, it is as well to make sure that they are so. This, of course, applies to all other materials to sample, especially the bricks and the Joiners' ironmongery. As the Slating is only a small trade, I propose to consider it more completely than the others, as a type of the supervision required for all trades. The first thing to look to is the quality of the slates. They should be both hard and tough, they should have a metallic ring when struck with the knuckles, and should not fracture easily when lightly struck against wood; if water poured on the slate is soon absorbed the slate is, of course, porous; slates with friable and splintered edges are generally bad; slates with green blotches in them, though the blotches do not affect the weathering qualities, are, by reason of their objectionable appearance, about £1 per ton cheaper than plain slates. Slates get shaken in their railway journey here, and if not properly packed a jolt in shunting a railway truck may sometimes crack the slates from end to end of the truck. The slater ought to test every slate for soundness before holeing it, and this he does by striking in on a bar in front of him, or by sharply tapping it with a hammer. Cracked slates, however slight the cracks are, should not be put on, as frost is sure to crack them. The holeing of the slates fixes the lap, and this is one of those

cases where a squeeze of £10. will put something in the contractor's pocket. The nail holes should not be so large that they will draw over the nailhead. In holeing, the slate sometimes breaks around the holes, and the slater, if not stopped, may turn the slate round and hole again. No slates which are broken or much chipped should be allowed. The labourer may so hole the broken slates that the broken end is hidden, when laid, by the upper slate, and there is then only one thickness of slate covering the roof at that point. The laths should be free from sap, and nailed to every spar. The roofs should be lined over before lathing, and any spars which are down or appear likely to sag should be attended to. The slates should, of course, be slightly tilted towards the roof at a gable unprotected by a coping, and the spars firmed out. Before laying, the slates, if in the least uneven, should be sorted into thicknesses, so as not to be laid at random, and any slates which are twisted should be rejected, as such slates will certainly ride, although the slater sometimes says: "Oh, they'll be all right; we put the flat side downwards." Of course, the heavier, and in Westmorelands, the larger slates should be laid at the bottom; the double-eaves course is sometimes slipped, and if it is not, the two bottom courses are sometimes nailed to a single lath. The nails, if expensive, as copper nails, are another point where the slater may try to save something if so disposed. Sometimes you will find nails of two weights on the job—one as specified, and the other lighter. I confess that I offer no explanation of this, and fear that you will not obtain a satisfactory one from the slaters. The nails should bulge out somewhat in the middle, to get a firm hold on the lath. The points of the slates should be vertically over each other, for the sake of appearance. Occasionally there is a tendency on the part of the slater to delay the pointing of the slates until after the ceilings are plastered, on the principle, I suppose, that what is out of one's sight is out of one's mind. The pointing mortar should be haired, or it will not stick to the underside of the laths, and some slaters do not put the hair in unless supervised. It is also a trouble to the men to get cement mortar specially to point the verges, and ordinary lime mortar will be used if you are not careful. The ridge tiles should be set and pointed in cement mortar, and, if flanged, the flanges should be away from the south and west to avoid giving a purchase to the gales from those quarters. The angle inside the ridge should be less than the rake of the roof, in order to grip it more firmly. I have entered into the slating in this detailed manner as an example to give you some idea of the multitude of little things in all trades which have to be seen to if the work is to be a credit to yourself and a satisfaction to the owner. I have already advised you to keep your eyes on the mixing of the plaster, and need not say more on the subject, except that you should satisfy yourselves that the lime is well slaked. Sometimes the plasterer finds it easier to fill up a space by laths in a different direction to the rest. The plaster at such points will possibly crack, so that you should not allow him to do this. Plaster on laths should be well "keyed"—that is, squeezed between and behind the laths. I have had it explained to me by a plasterer, where the key on some stoothing was absent, that key on lathed upright partitions was as unnecessary as on walls, as there was no pull from the plaster as on ceilings; but that plasterer did not make a convert, and I name the incident as an example of the numerous good reasons for doing bad work which are constantly being brought forward. It is surprising how monotonously sap and other defects in laths are declared to be "only a little stain." Of course, in some cases, what at first looks like sap proves, on closer examination, to be only surface dirt. You will find a source of considerable trouble and annoyance in the independence of some trades and the ignorance of some workmen. I refer to such matters as the cutting of bearing timbers by plumbers and gasfitters and their kind, who will, unless you warn them beforehand, chop right through your bearing timbers without compunction if it suits them to run their pipes in such ways. The Plumber is such a monster in the popular imagination that you will be pleased to find him, on the whole, neither better nor worse than his fellow tradesman. However, should he be so inclined, his opportunities for taking advantage of you are many, especially in the lead in gutters, flashings, &c., and which should, of course, always be tested for size, lap,

weight, and fall, as all of these are liable to be skimmed; and, as the plumber is able, when cutting the lead, to give a twist with his knife which thickens the edge, it is better not to rely on the lead gauge, but to weigh a bit of the lead, and calculate the weight therefrom. The eaves, gutters, and down pipes should also be inspected for correct and even thickness. The Painter's trade is one of the most difficult for the architect to exercise supervision over the materials, and I recommend you to make a study of these. It is well to have each coat of paint of a different shade. Of course, the variation need only be slight, but if you see each shade on everywhere you know that all the coats are on. This refers more especially to the constructional steelwork, where a coat is often slipped. We have all heard of people who couldn't open a single window when they went into their new building, and couldn't get the architect to attend to it for three days; and before the client occupies your building I advise you to go round and see that the sashes are not stuck with the paint, that the window-fasteners work properly, that none of the keys are missing, that the damaged slates are repaired, that the eaves gutters are clear of rubbish, and, not least in importance, that the w.c. cisterns are in working order, and other little things of a like kind, which if left imperfect make a new building unpleasant for its occupiers, and may lead to accusations of neglect on the part of the architect.

HIGH-TEMPERATURE REFUSE DESTRUCTORS.

THE disposal of refuse formed the subject of a meeting held on Friday night in the Geographical Institute, Newcastle. Mr. F. J. Edge, city engineer of Newcastle, presided, and a lecture on the subject was given by Mr. W. F. Goodrich. The chairman said the subject was extremely important. He was glad to see that in the subject "refuse disposal from sanitary and commercial standpoints" the sanitary was given the first place, because refuse disposal should be first of all considered from a sanitary standpoint. He did not like the expression "commercial standpoint." He would like Mr. Goodrich to tell them about refuse destructors that had been erected adjacent to residential property, and whether there had been any complaint. The modern type of high-temperature destructor ought not to be a nuisance at all. He would wish Mr. Goodrich to give them also some information about the different methods of destruction. He would like to know something about the results where the heat was not utilised at all, where a partial use was made of the heat, and where the whole heat was utilised for motive power. Mr. Goodrich said the destruction of refuse by fire was accepted as the most efficient and sanitary by modern science. In London thirteen of the Metropolitan boroughs had refuse destructors, and the other fifteen got rid of their refuse in various ways. He described the method of hand-sorting at depots, which, he said, had many objections from a sanitary point of view, the operation being carried out largely by women, who stood up to their waists in filth. Much of the refuse was sent to the sea in barges, and to this there were sanitary objections, as it might be returned by the tide. Much of it was sent to tips, and the odours from the accumulated tons of refuse were very offensive. In several towns destructors consuming refuse by fire existed in central situations, surrounded by good houses, and there was no complaint at all. There were no offensive gases, and the dust was all collected inside the destructor and was not allowed to reach the outer air. He contrasted the old method of burning refuse in cells at a temperature of 700° with the modern high-temperature method, with forced draught and regenerators at 2,000°. Describing the destructor at Fulham, which was used with an electrical plant, he stated that 26·62 units of electricity were produced per ton of refuse burnt. In addition to that, the clinker was used for making bricks and flags. At Sudbury they not only pumped the water, but found that the clinker made the best filtering material. At Ipswich the refuse destructor was to be used for producing electricity for lighting and traction; and at Lancaster they had a surplus, in the same way, of £1,353. At Llandudno 30 units of electricity were produced per ton of refuse burnt, and at Sherness, where there was an electrical plant worked by the destructor, they saved in six months £130, of which £189 represented a saving in coal. It was essential that the site of a destructor should be central to save the cost in carting.

OBITUARY.

THE death of Mr. JOHN BERNARD HARDMAN, the head of the well-known firm of John Hardman and Co., stained glass manufacturers and ecclesiastical metal workers, of Birmingham, occurred on Sunday at his residence, 130, Hagley-road, in that city. The deceased gentleman, who, in addition to his business connection, was the most distinguished Roman Catholic layman in Birmingham and a public-spirited citizen, was only sixty years of age, but his health had been failing for about two years, following on a bad attack of influenza. Mr. Hardman was born on May 5, 1843. His father, Mr. John Hardman, was of a Roman Catholic family which originally belonged to Lytham-in-the-Fylde, Lancashire. James Hardman, of this family, removed to Birmingham in the middle of the 18th century, his son, the first John Hardman of local fame, entering into the manufacture of buttons and medals. The late Mr. J. B. Hardman's father, forming an acquaintance with the elder Pugin, became enthusiastically interested in the Gothic Revival connected with the accessories of religious worship, and in 1838 he founded the ecclesiastical metal works, to which in 1845 he added the manufacture of stained glass. For many years he was in daily communication with Pugin, and was associated with him in the establishment of a studio of Christian art at Rainsgate, where were produced the cartoons for church windows which were carried out in Birmingham. John Bernard Hardman received his education at St. Mary's College, Oscott, at the Oratory, Edgbaston, and at the Catholic University of Dublin. In 1863 he returned to Birmingham, where in a short time, upon his father's death, he became a partner in the ecclesiastical art business then carried on in Newhall Hill, his partners being Mr. William Powell and Mr. J. H. Powell. In 1883 a separate manufactory for metal work was established in King Edward's-road, where the business was carried on under the title of Hardman, Powell, and Co. In 1876 Mr. Hardman became a member of the board of management of the General Hospital, and last year was appointed chairman of that body. He was also for four years a member of the committee of the General Dispensary. In 1874 Mr. Hardman was invited by the British Commissioners of the International Exhibition at Vienna to act as English juror for exhibits in art metal work and jewelry, and for these services he received the honour of being made a Chevalier of the Order of Franz Josef of Austria. Mr. Hardman was a member of the estates committee throughout his association with the council, and in 1883 and 1884 he was its chairman. Having been actively connected with the old School of Design, Mr. Hardman was, upon the school being taken over by the corporation, made a member of the new Museum and School of Art Committee, and he was also a member of the Art Gallery Purchase Committee. In February, 1901, Mr. Hardman's distinguished work received recognition in the bestowal upon him by the late Pope of the Order of St. Gregory the Great. Mr. Hardman was twice married, and leaves a widow, four sons, and eight daughters.

A preliminary meeting of those interested in the formation of a Quantity Surveyors' Association will be held on Wednesday week, the 18th inst., at the Duke's Saloon, Highborn Restaurant, at 4 p.m. We trust that it will be numerously attended by members of the profession, that a strong and representative committee may be selected, and the association put on a sound working basis. The hon. sec., pro tem., is Mr. F. B. Hollis, 17, Bedford-row, W.C., to whom all communications and suggestions should be sent.

The Court of Arbitration under the Metropolitan Water Act of last Session gave their decision on Monday on the question of the sinking fund and sterilisation clauses as affecting all the water companies. They came to the conclusion that the water properties were subject to the charge of such a fund, and that it must be valued as it stood. For these reasons they concluded that the contention put forward on behalf of the Water Board was right. The case for the Water Board was then continued, Sir A. R. Binnie, late engineer-in-chief to the London County Council, being under examination during Monday and Tuesday. Mr. G. F. Deacon, of Liverpool, also gave evidence in support of the Water Board's figures.

New sewerage works for Morpeth, carried out from plans by Messrs. Balfour and Son, of Newcastle, Mr. Kirtley, of Sunderland, being the contractor, were inaugurated on Friday.

PROFESSIONAL AND TRADE SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. W. Curtis lectured before the members of this society on Monday evening, at the rooms, Harrington-street, Liverpool, his subject being "Street Architecture: Formal or Irregular." The chair was occupied by Mr. J. Woolfall (president). The lecturer's remarks were illustrated by a large number of lantern slides reproducing typical examples of street architecture in various parts of the country. Specimens were also shown of types to be found in Italy, Germany, and France, whilst some views of more modern buildings in Edinburgh were thrown upon the screen. The effect of the straight line in architecture was noticed, and observations were made on the principle of constructing thoroughfares at right-angles. Regent-street, London, was selected as showing the beauty to be obtained by the formation of a curved street, and Wren's proposed plan for the rebuilding of London was also projected. To a certain extent, the lecturer said, the appearance of a building depended on the class of stone of which it was constructed.

CHIPS.

A sum of £5,000 is required to build the new permanent church of St. Luke, New Brompton, which, from a population of 13,000 in 1880, has grown into a working-class town of 45,000. There are only four parish churches, with a total accommodation of about 3,120. During this autumn in close proximity to the mission several streets are being opened up, and the plans for 120 new houses have just been passed. A freehold site for the erection of the church has been secured.

The jubilee of St. Luke's Church, Southampton, was celebrated last week. Various alterations, additions, and improvements have been carried out in the church, among these being the re ceiling of the nave and aisles, the introduction of a special system of ventilation, and the painting of the church throughout. In the chancel stenciling work has been done, and the choir seating rearranged. A carved oak altar retable has been provided. The north chapel has been treated in similar fashion to the chancel.

Johann Fadruss, the well-known sculptor, died at Buda-Pesth last week.

The rural district council of Uttroxteter at their last meeting adopted plans by Mr. Wilcox, C.E., for the drainage of the village of Denstone (estimated to cost £900), and instructed the same engineer to prepare plans for draining Rochester.

A meeting of the new town-hall committee of the Newcastle-on-Tyne Corporation was held last week, when instructions were given the property surveyor to prepare plans and estimates for rearranging the present town-hall. It is proposed to do away with the concert-room and at least one-third of the corn-market. The plans and estimates will be laid before the committee in due course, and subsequently the matter will come before the city council.

The Folkestone Town Council have received sanction from the Local Government Board for the borrowing of £14,950 for the purchase of land and the erection of a refuse destructor in the town.

The Local Government Board have approved of the scheme of sewerage and sewage disposal for Hagley and Blakedown, at an estimated cost of £7,500, prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham. The Bromsgrove Rural District Council at their last meeting gave instructions for tenders to be obtained at once.

Col. W. R. Slacke, R.E., has held a Local Government Board inquiry at Clown, into the application of the Rural District Council for permission to borrow £3,000 for carrying out a sewerage scheme for Hollin Hill.

At Selwyn College, Cambridge, the dedication has taken place of a window in the chapel in memory of the Hon. Arthur Temple Lyttelton, late Bishop of Southampton, who was the first Master of the college. Like the rest of the windows in the chapel, it is designed by Mr. C. E. Kempe, and forms part of a larger scheme which is being gradually carried out. It contains figures of St. Luke and St. Boniface, Anskar, and Methodius.

The Bishop of Oxford recently officiated at a dedicatory service in Little Marlow Church, Buckinghamshire, which has recently been restored at a cost approaching £1,000. In the course of the restoration, two entrances and steps in the north nave wall to the roof loft were discovered, having been built up from Reformation days, while a Norman piscina, in perfect preservation, was also built up in the stairway, and a priest's door has also been opened out in the north wall of the chancel.

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Our Illustrations.

THE KING'S SANATORIUM, MIDHURST.

THE King laid the foundation-stone of this building last Tuesday at Midhurst, and to-day we give the bird's-eye view and plans. The first-floor plan, of which we give the central portion only, is, so far as the wings are concerned, practically a repeat of the ground floor arrangements. Mr. H. Percy Adams, F.R.I.B.A., is the architect. The contract for the foundations is being carried out by Messrs. Langley, of Crawley, and Messrs. John Aird and Son did the plumbing operations for the water supply. Dr. Latham was the author of the international competition prize essay, on which the scheme for the sanatorium was based; but Mr. Adams has made his own plans on the lines advocated.

THE ENTRANCE HALL, ELVEDEN.

THIS drawing illustrates the octagonal entrance-hall of this mansion, from the designs of Mr. Clyde Young, the architect. The view was exhibited at the Royal Academy this year. The delicately-enriched plaster dome is carried by marble columns, having Corinthian caps and pedestals of the same material, the walls being panelled all over up to the frieze. Elveden Hall is situated in a game-preserving heathland district in Suffolk, some four miles from Thetford, formerly the residence of Admiral Keppel, the naval hero of a century since; it was for many years the seat of the late Maharajah Dhuleep Singh and his son Prince Frederick Singh. Mr. John Norton carried out much of the building erected by the late Maharajah, and Mr. Clyde Young has just built an exceedingly elaborate Indian hall for Lord Iveagh, the present owner of the property.

NATIONAL SILVER MEDAL DRAWING: "THE RED KNIGHT'S RETURN WITH ELSINORE."

THE drawing in question is an illustration to a story of my own. The context is as follows:—"A certain Red Knight returns home from wars in foreign lands, to find that, in order to escape from a forced marriage with his brother, who has given out false news of the Red Knight's death, his promised bride, Elsinore, has poisoned herself. Mad with grief and fury, he kills his brother, and, bearing dead Elsinore in his arms, leaps his horse over the cliffs at a place where he had been washed ashore thirty years before as a little child." It may be of interest to state that the drawing has been selected for exhibition at the St. Louis Exhibition by the Education Committee as an example of British students' work.

Antwerp.

ARTHUR WATTS.

NEW CHURCH OF ST. THOMAS, EAST KIRKBY, NOTTS.

THIS church was consecrated in May of this year. Sitting accommodation is provided for 360 adults, the congregation being entirely seated in the nave,

the aisles being merely passages about 4ft. wide. The principal entrance is at the west end, facing Lowmoor-road, the highway between Nottingham and Mansfield, and an internal porch is formed by a screen and swing-doors. A low, broad treatment has been adopted throughout in the design of the building and all its details and fittings. The walls are of brick, with local red-brick facings and Weldon stone dressings, the internal piers, arches, and corbels being of Ancaster stone, and the walls plastered and duresco-washed light olive green. The roofs are of pitch-pine, stained brown, and are covered with red tiles, the turret roofs being covered with lead. Messrs. Thompson and Sons, of Louth, Lincolnshire, were the contractors for the general work, and the seating (of pitch-pine stained brown), also the choir seats and pulpit, which are of oak. The carving, both wood and stone, was executed by Mr. Tuttle, of Lincoln. The dorsal hangings and the materials for the altar frontal were supplied by Messrs. Morris and Co., and the frontal was worked from the architect's designs (with some variations) by the ladies of the Southwell Diocesan Embroidery Guild. The boundary wall and gates were carried out by Messrs. G. Hopewell and Son, of New Basford, Nottingham. The total cost of the whole of the work was between £5,000 and £6,000. Mr. D. Davies was the clerk of works, and Mr. Louis Ambler, F.R.I.B.A., of London, the architect.

"THE COURT," ULLESTHORPE.

THE additions to the "Court," Ullesthorpe, Leicestershire, which are now carried out are a sitting-room, drawing-room, inner hall, dining-room, billiard-room, and three bedrooms and dressing-room, with a large landing as picture gallery. Further additions are in progress, consisting of a servants' hall, three bedrooms, and dressing-room, extra bathroom and other sanitary arrangements. The stabling and coachhouses are being rearranged, and new entrance gates erected. The work is being executed by Messrs. Robert Cooke and Sons, of Broughton Astley, from the drawings and under the superintendence of Mr. W. H. Harrison, F.R.I.B.A., of Victoria-street, Westminster. The sitting-hall is panelled throughout with oak panelling, and a new oak staircase has been constructed. Massive oak beams have been inserted in the sitting-hall and study.

HARBORNE PARISH CHURCH SCHOOLS.

THE addition of the two new classrooms to the above has recently been made from designs by Mr. Ralph Heaton, architect, of Birmingham. The materials were Hollington stone and bricks, and the cost about £650. Messrs. E. Giles and Son were the builders.

SALE ROOM SKETCHES.

THESE sketches were made at Messrs. France and Sons' rooms at a recent sale, which comprised a varied assortment of old furniture. The high-backed Charles I. Chair, which was sold for £9, has a cane back, with leather seat studded with brass-headed nails, the back legs and stretcher carved in the manner of that period. The Armchair was unsold. This also has a shaped and carved back, on carved legs and stretcher, upholstered in crimson velvet. The Gentleman's Wardrobe, of Chippendale pattern, was sold for £12. The upper part is fitted with sliding trays, inclosed by a pair of shaped panel doors, with carved pateries, surmounted by a finely-carved and fluted dental cornice. It also contains three large drawers. Lot 1st, the gem of the collection, was withdrawn, the reason not stated. It was described in the catalogue as a 7ft. 9in. circular Chippendale Table of unique design, with carved rim edge and finely-carved scroll-shaped gallery on fluted and richly-carved pillar, claw, and toes.

Professor H. S. Hele-Shaw, of Liverpool University, has been appointed, through the Colonial Office, to organise technical education in the Transvaal and the Orange River Colony. The appointment is not a permanent one, and Professor Hele-Shaw has been granted leave of absence by the University Council until September next.

The urban district council of Skipton have adopted the recommendation of Mr. Hill, E.C., of Manchester, to construct an additional reservoir on a site favourably reported upon by Prof. Boyd Dawkins. The proposed capacity of the new reservoir will be 140,000,000 gallons. The site of the new undertaking is at the foot of Embsay Moor, and is within about two and a half miles from Skipton.

COMPETITIONS.

ACTON.—The Town Hall and Municipal Buildings competition at Acton, W., has been decided. From over eighty names the following architects were selected to compete—viz., Messrs. H. T. Hare, Russell and Malloes, Maurice B. Adams, Lanchester, Stewart, and Rickards, Arthur Ardron, and Mr. W. G. Hunt. Mr. MacVicar Anderson is responsible for the result, and he has chosen the design submitted by Mr. Hunt. The estimates ranged from £50,000 to £80,000, the chosen plan being amongst the lowest. The accommodation to be provided was precisely stipulated, and the cost was to be calculated at one shilling per foot cube measured in all cases from below the footings. The designs are not on view yet, but arrangements are being made for their early exhibition in the Priory Schools, Acton.

MANSFIELD.—A special meeting of the Mansfield Town Council was held at the town-hall on Saturday, the business being the consideration of the competitive plans submitted for the erection of a new free public library, towards which Mr. Andrew Carnegie has given £3,000. The report of the assessor, Mr. Albert Nelson Bromley, of Nottingham, stated that he had investigated the six sets of drawings sent in for this competition, and he considered that the first premium should be awarded to the design marked No. 1. The author of this design showed a compact economical plan, with excellent supervision from the lending library. An entrance-hall, shut off from the street by a lobby with swing doors, gave in this design access to the lending library; also to the reading-room, the ladies' room, and the men's conveniences, all of which have direct supervision from the lending library. The reference-room was placed at the end of the reading-room; but this also had direct supervision from the lending library. A librarian's room, packing-room, and book-store were placed at the end of the building. The external design was well balanced and pleasing, but the figure subjects in the gable of the pediment were somewhat large. The second premium should, the assessor considered, be awarded to design No. 3. The plan had considerable resemblance to design No. 1, and the placing of the rooms almost identical, but it lacked compactness, and the elevations were not so much in keeping with the purpose as design No. 1. The chairman of the sub-committee recommended that the report be adopted and that design No. 1 be accepted, with slight modifications suggested by the assessor, and that the design No. 3 be awarded the second premium. The names of the competitors chosen are: No. 1, Mr. E. R. Sutton, Nottingham; No. 2, Mr. J. E. Goodacre, Mansfield. The report was adopted, and it was decided to place rooms in the town-hall at the disposal of the committee for the purpose of exhibiting the plans to the public.

CHIPS.

THE foundation-stone of the new workhouse nurses' home at Norwich was laid last week. The building, which lies just off the Bowthorpe-road, is to be constructed of red brick with Ruabon terracotta tracings to gables, while the sills and heads to windows will be of red Mansfield stone, and the roofs of Broseley tiles. The home will contain dining-room, sitting-room, superintendent nurse's room, kitchen, scullery, 14 bedrooms, baths, lavatories, and out-buildings, and will cost about £2,200, while the furnishing will cost another £800. Mr. B. B. Morgan, of Messrs. Morgan and Buckingham, Norwich, is the architect.

Mr. W. O. E. Meade-King, M.Inst.C.E., an inspector from the Local Government Board, held an inquiry at St. Mary's Hall, Welwyn, Herts, last week, to receive evidence of persons interested in the application for sanction to borrow £3,260 for works of sewerage and sewage disposal for the parish of Welwyn.

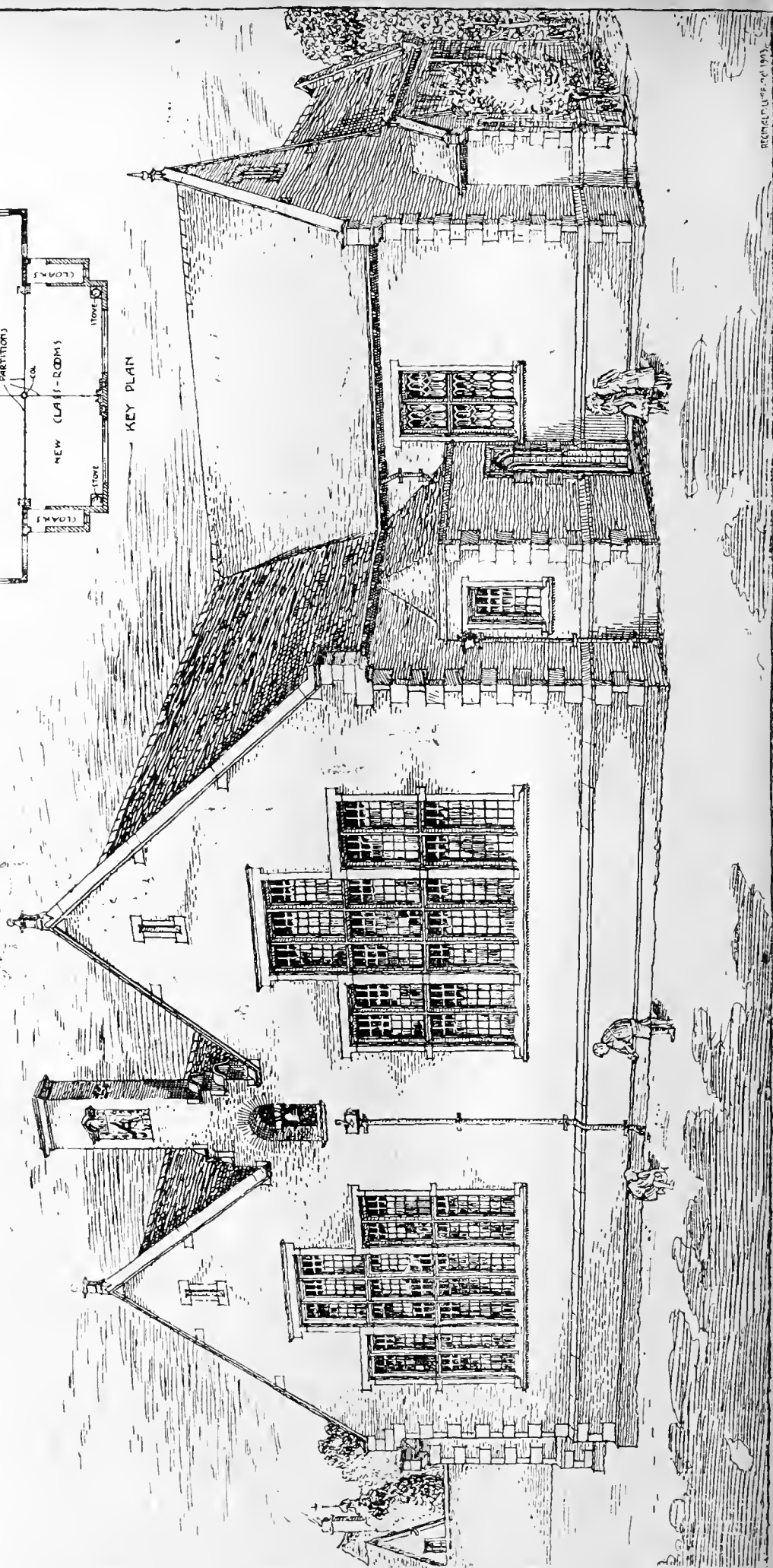
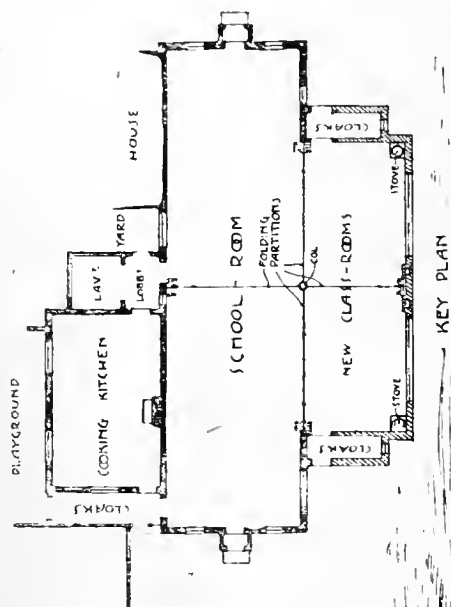
At Twyford, Hants, a new village-hall has just been completed. Mr. Kitchen, of Winchester, was the architect, and Mr. Young, of Twyford, the builder.

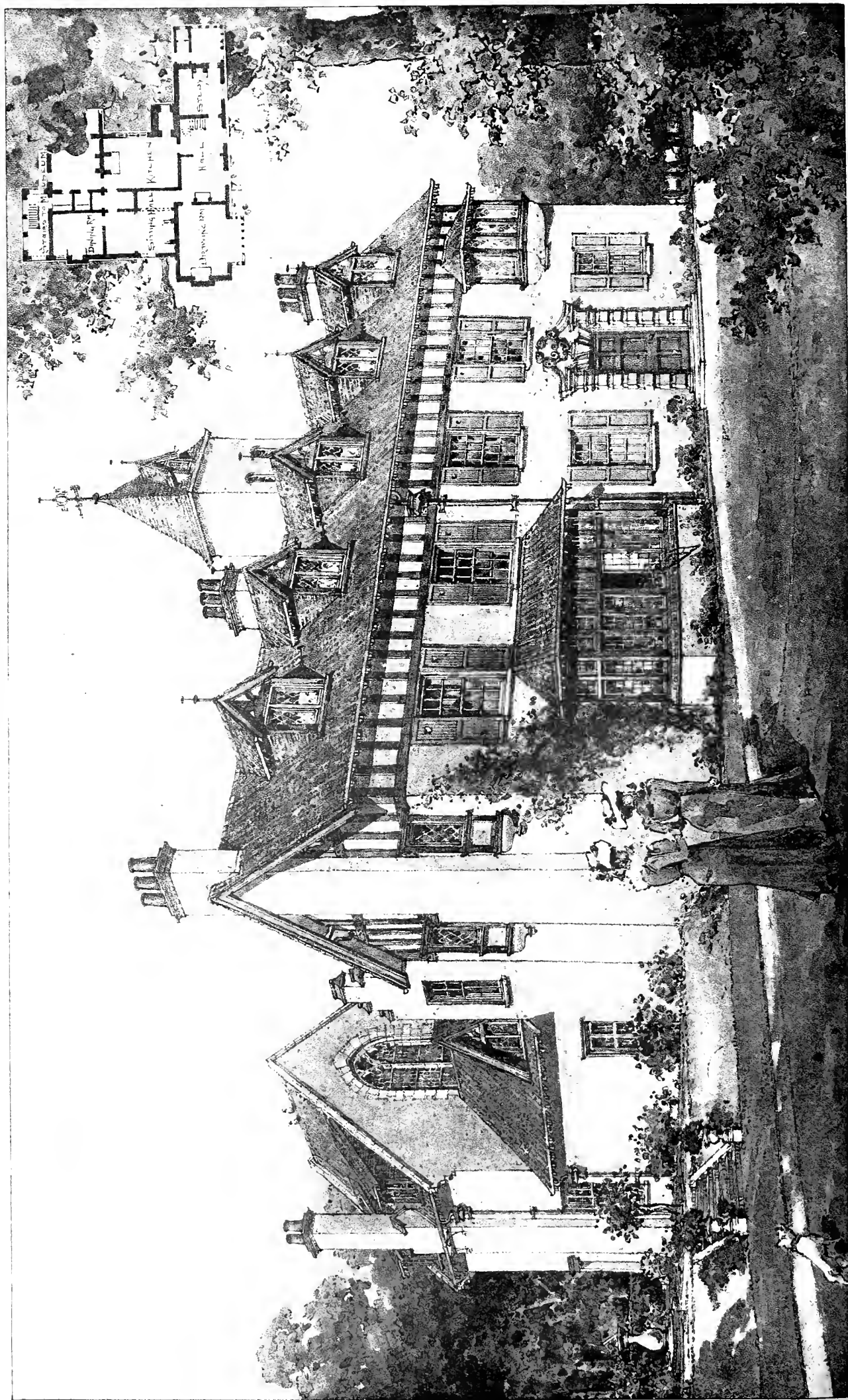
The Manchester and District Engineering Trades Employers' Association are seeking to bring about the standardisation of various structural parts of Lancashire boilers.

The total expenditure on the late Mr. J. F. Bentley's Westminster Cathedral up to the present time for work and material, including payments for the Chapter Hall and for the cloisters connecting the Cathedral with the hall and with the Archbishop's house, has been £196,000. On the general building fund account there is now a deficit of over £7,000.

NEW CLASS-ROOMS. HARBORNE, NEAR D-HAM.

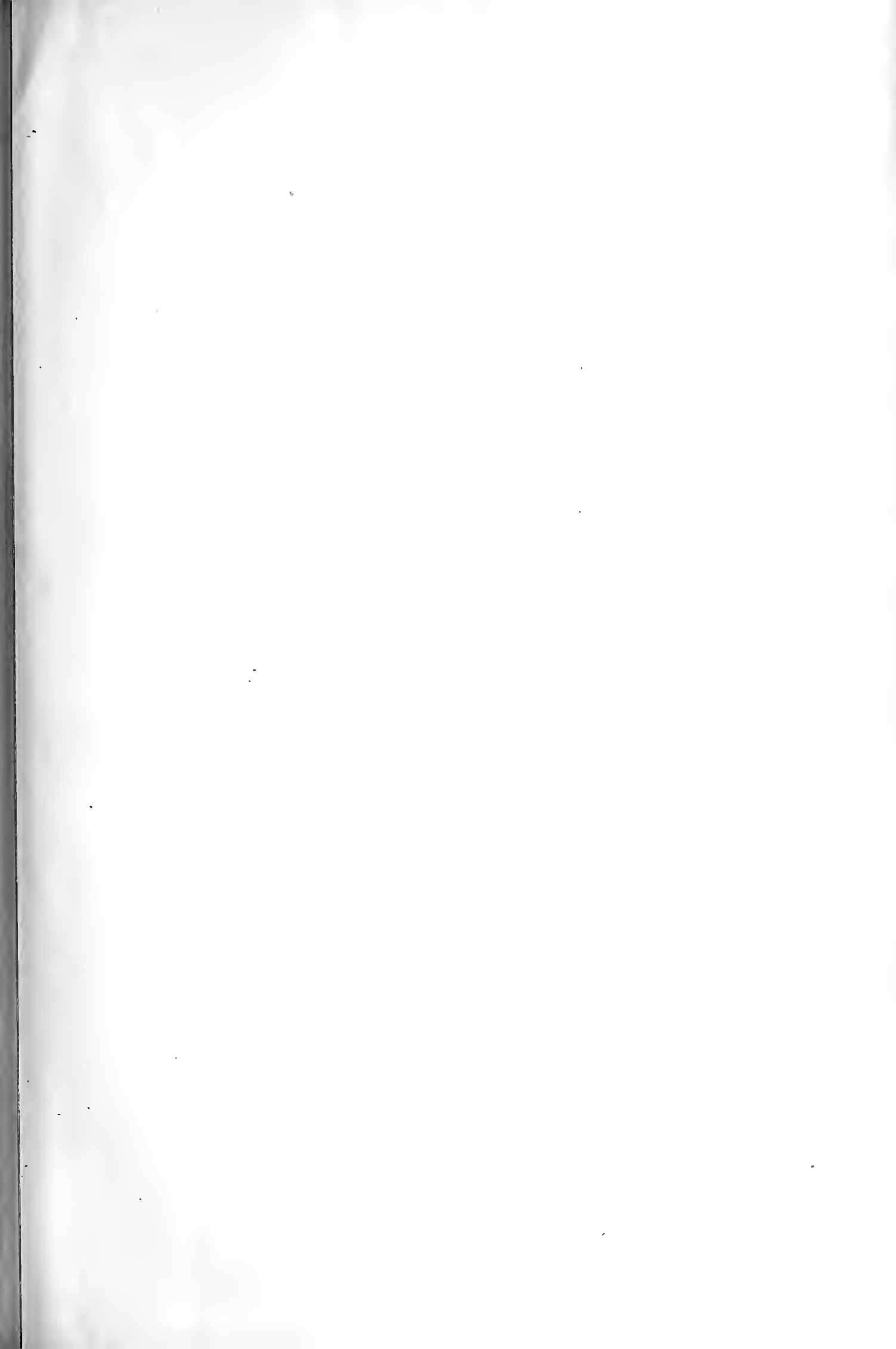
RALPH HEATON: ARCHITECT

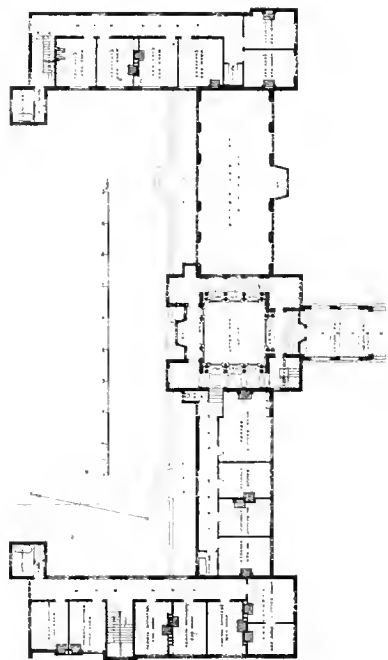
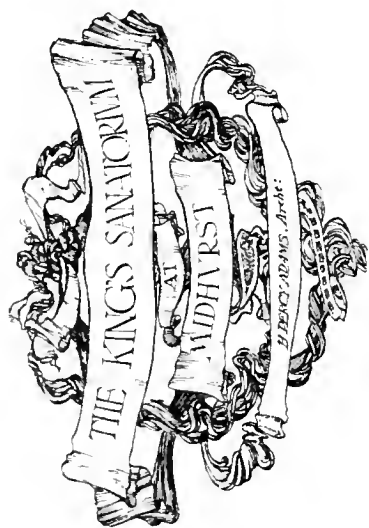




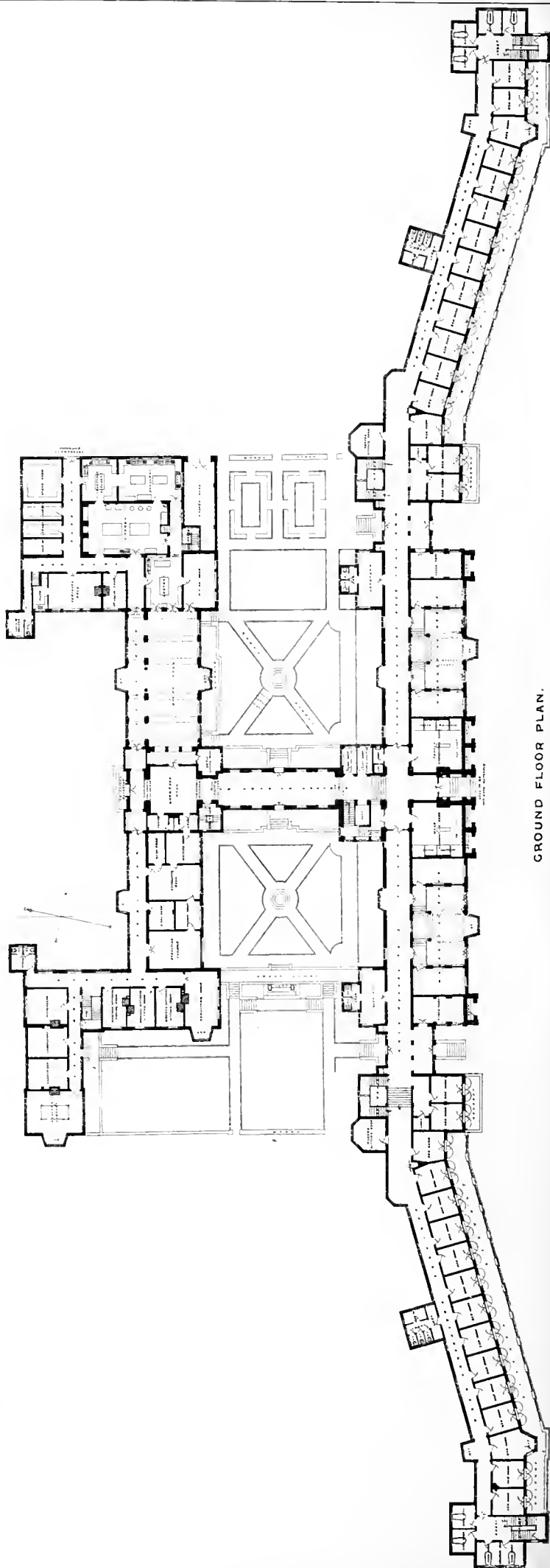
ADDITIONS TO HIRSTHURST COURT WIMBORNE AVON

"Photo-Tint" by James Akerman 8 Queen Square London W.C.





FIRST FLOOR PLAN.



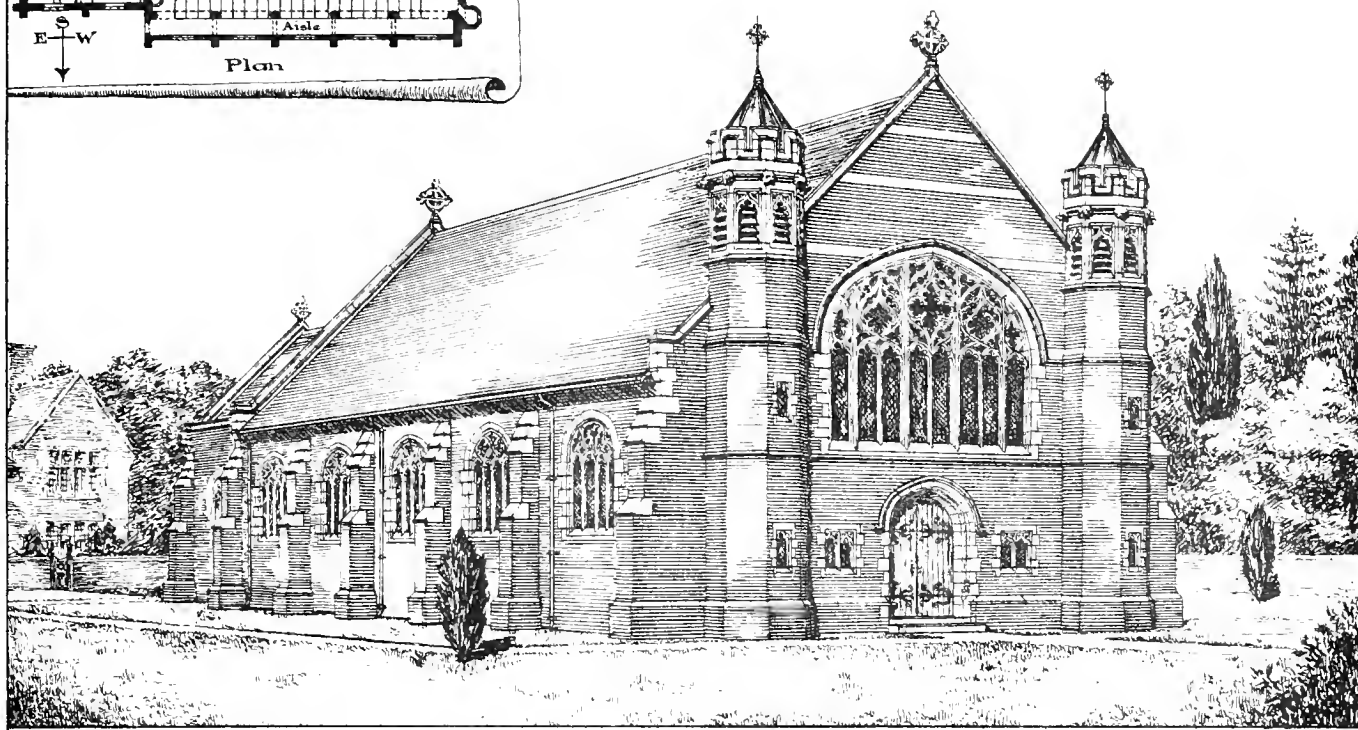
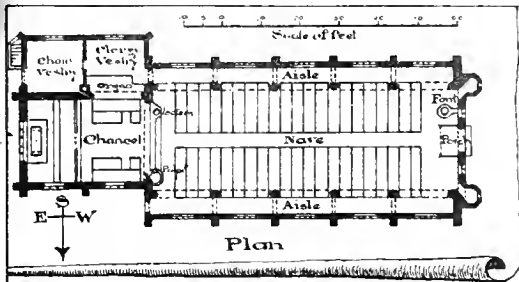
GROUND FLOOR PLAN.



The Red Knight comes back to his mother the Sea, bearing dead Elsinore.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

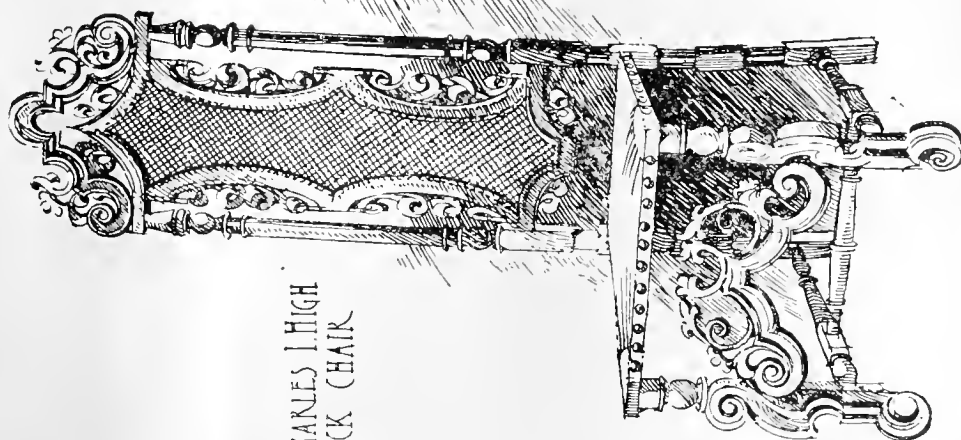
NATIONAL SILVER MEDAL DRAWING



New Church, St. Thomas, East Kirkby, Nottinghamshire. Louis Ambler, F.R.I.B.A. Archt.



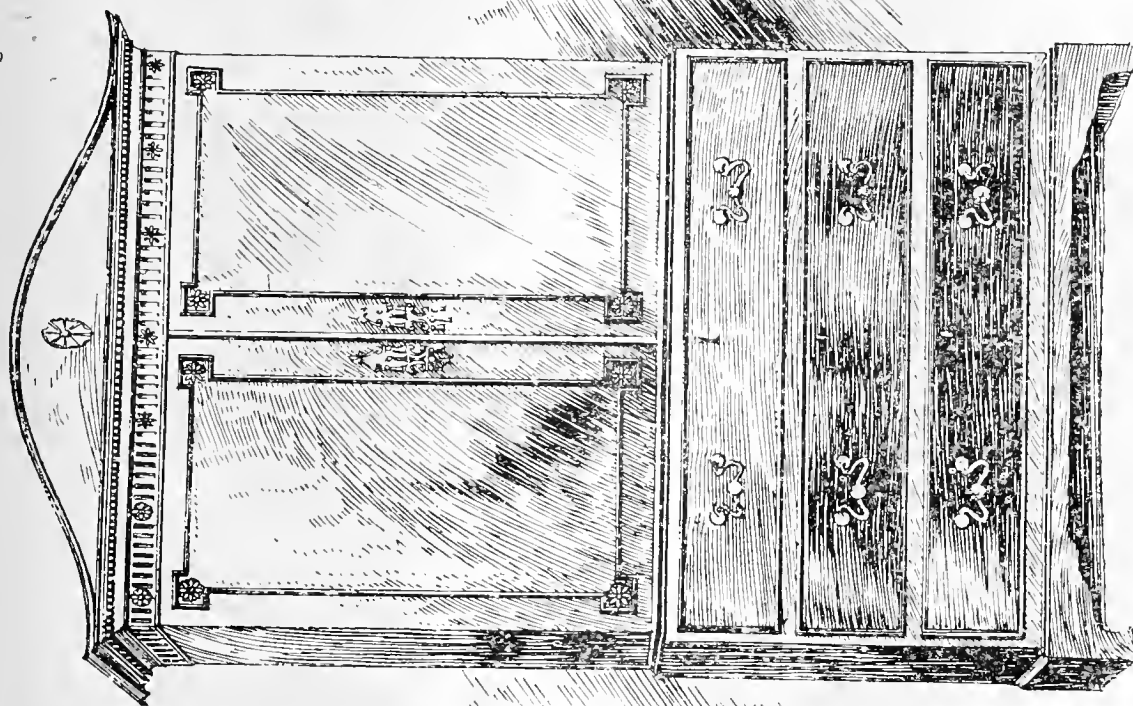
SALE ROOM



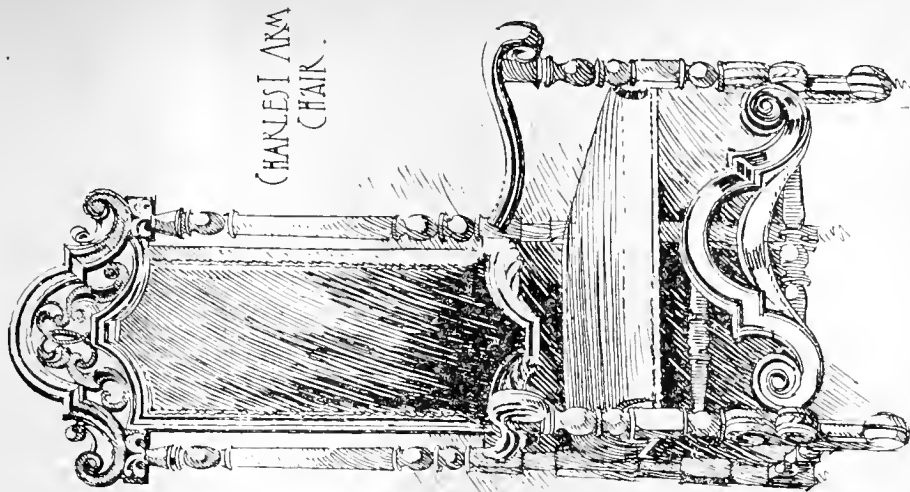
CHARLES I HIGH
BACK CHAIR

SKETCHES FROM

MESSRS FRANCE AND SONS ROOMS



(HIPPENDALE MAHOGANY WARDROBE



CHARLES I ARM
CHAIR.

W. J. H. W.

Building Intelligence.

EALING, W.—Mr. Dudley Perceval laid the foundation of the Perceval Memorial Church (All Saints') at Ealing on Saturday. This church is being built as a memorial of Mr. Spencer Perceval, Prime Minister from 1809 to 1812, who was shot in the lobby of the House of Commons in the latter year. The site, which forms part of the grounds of the house, Elm-grove, which Mr. Perceval occupied at the time of his assassination, was given by Mr. Leopold Rothschild, and the cost of the building (between £12,000 and £13,000) is being defrayed out of moneys left for that purpose by Miss Frederica Elizabeth Perceval, the last surviving daughter of Mr. Perceval, who died at Ealing at a great age three years ago. The architect is Mr. W. A. Pite, F.R.I.B.A., who has designed an edifice based upon a phase of Early Perpendicular Gothic. The material externally will be of Stamford stone, with rock-faced walling in dropped courses, and internally the floor and chancel walls will be of marble, and the stalls, pulpit, and screen of fumed oak.

GRANGEMOUTH.—Grange U.F. Church, which was opened on Friday, is designed in a severe type of Early English Gothic, with very simple detail, and little or no ornament except such as naturally arises from the design. The longest front, in which is the main entrance, faces Grange Bank-road, along which it extends 126ft. A square tower, about 70ft. high, is placed at the north end of this front, and the principal entrance is at the base of this tower. Internally the church is divided into nave and side aisles by an arcade of three pointed arches on each side. At the pulpit end an arch of wide span divides the church from the organ-chamber, which is continued beyond the church. The ceiling is semi-octagonal in form, divided into bays by the main couples, and lined with dressed timber. The interior decoration is carried out in subdued tones of soft green and brown tints, relieved by bands of brighter colour. The seating and panelling are stained myrtle green, with the woodwork of pulpit and gallery front in grey oak. The church will seat over 630 persons, and the hall in connection is seated for 400 people. There are also a large session-room, vestry, &c. The cost has been £4,000. The architect is Mr. John B. Wilson, A.R.I.B.A., and I.A., Glasgow.

LIVERPOOL.—Princess Louise, Duchess of Argyll, laid on Wednesday the foundation-stone of the workmen's dwellings to be erected on the Hornby-street area. This embraces Hornby-street, Tatlock-street, and Raymond-street, and is being acquired by the Corporation as an unhealthy area under the powers of the Housing of the Working Classes Act, 1890. The total number of insanitary houses proposed to be acquired is 511, in addition to which there are 23 sanitary houses, making a total of 534. The population of the insanitary houses is 2,431. The new dwellings will comprise 23 blocks, or 445 dwellings, which, it is estimated, will accommodate 2,446 persons. There will be 48 four-roomed dwellings, 270 three-roomed dwellings, 90 two-roomed dwellings, and 36 one-roomed dwellings, a keeper's house, seven shops, and a recreation ground containing about 1,755 square yards. In Hornby-street the new dwellings are to be set back from the present line of street, increasing the width between the main line of the new dwellings from 36ft. to 70ft. The contractors for the first portion are Messrs. Joshua Henshaw and Sons, of Chatham-street, the amount of the contract being £23,382. Total area of the whole scheme is 26,025 square yards, and the estimated cost of carrying it out is £150,000.—The Marquis of Londonderry, K.G., President of the Board of Education, paid a visit to Edgehill Training College on Saturday, and declared open the new wing which has just been added to that institution at a cost of £11,800. Previous to the additions just completed, the college consisted of an educational wing with dormitories along the Clint-road front, and an administrative building connected with it, but facing Durning-road, with, on the Merivale-street side, a recreation room with dormitories above it. The present additions embrace a new wing extending from the end of the old recreation room. The old and new wings are nearly parallel, and are connected at their western ends by the administrative block. The ground floor of the new wing comprises a physics laboratory, 28ft. by 35ft., lecture-room, 66ft. by 27ft.,

divisible by a movable partition, gymnasium, 49ft. by 27ft., and steam laundry with an electric motor for driving the machinery, &c. On the first floor there are an art-room, 39ft. by 24ft., a dormitory for 18 students, and a governess's bedroom. There is another dormitory for 16 students over the gymnasium, with on the floor above a natural science room, 26ft. by 27ft., with glass roof and windows to the north. The elevations have been designed in keeping with the existing building, the façade to Merivale-street being of a Renaissance character. Messrs. T. Mellard Reade and Son, of Liverpool, have acted as architects for the college since its inception.

LONDON COUNTY COUNCIL.—At the meeting, on Tuesday, of this body, Mr. A. L. Fell, of Sheffield, was appointed chief officer of the Council's tramways at a salary of £1,500 a year. On the recommendation of the Highways Committee, the tender of Messrs. J. Musgrave and Sons (Limited), of Bolton, for the construction of four 5,000H.P. engines for the electricity generating station at Greenwich at a sum of £96,713 was accepted. There were seven tenders at a lower price, but several were incomplete. The Council decided, after a long discussion, by 61 to 44 votes, in opposition to a recommendation of the Highways Committee, to serve notice on the London Southern Tramways Company for the purchase of its system, extending from Vauxhall Bridge to West Norwood Station, 5½ miles in length. It was objected that the necessary street-widenings and conversion of the lines for electrical traction would involve an outlay of £450,000, and that the system did not at present pay. A recommendation by the Parks Committee that application be made for Parliamentary powers to prevent any building over the garden of Edwards-square, Kensington, and that it be referred to the committee to communicate with the owners of garden-squares in London, and to advise the Council as to what Parliamentary powers were desirable for the better preservation of such squares, was agreed to after discussion.

PLUMSTEAD, S.E.—The foundation-stone has been publicly laid of the new Church of the Ascension in Timbercroft-lane, on the borders of Plumstead, a district which is being rapidly built upon. The building, which will be put up in sections, is from the design of Mr. A. E. Habershon, A.R.I.B.A., of Queen Street-place, E.C., Green's End, Woolwich, and Erith. The site has 40ft. roads on three sides. The present portion includes three bays of the nave, and one side aisle, and a part of the chancel and vestry. When finished the church will have one more bay added to the nave arcade, a second side aisle, and two transepts, a narthex being under the main west window. The materials of which the church is constructed are:—Outside, stock bricks with red brick and terracotta bands, the arches over window and door openings being in alternate blocks of Doulton's red and buff terracotta. Inside, red brick arches to the nave resting on stone columns, and a red brick chancel arch, the walling being in yellow brick with red brick bands and ornamentation. The cost of the present portion (with seating) will be about £2,500. The builders are Messrs. J. Dorey and Co., of Brentford.

STREATHAM.—The London Baptist Association Church, Mitcham-lane, Streatham, S.W., occupies a prominent corner site. The portion erected at present includes the nave and aisles, as far back as the transepts, galleries, tower, and temporary apse; also two vestries which form a church parlour when the dividing folding partition is thrown back. The buildings are designed in a Late period of Gothic, faced in red brick and stone dressings. The accommodation provided is, on ground-floor 270 adults, in gallery 200 adults, total 470. In the complete scheme there will be 856 sittings, or a mixed congregation of about 1,000 persons. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's-inn, Strand, London, W.C.

There has lately been erected by Messrs. Jones and Willis, in Llangoedmore Church, South Wales, a stone pulpit, as a memorial to the late Ven. William North, M.A., rector.

The opening meeting of the Edinburgh Architectural Association was held in the Association Rooms, 117, George-street, on Wednesday evening. Mr. A. Hunter, F.R.I.B.A., president, occupied the chair, and delivered his annual address, the subject being "Haddon Hall." The lecture was illustrated by numerous lantern views.

LEGAL INTELLIGENCE.

ANCIENT LIGHTS.—At Dudley County Court on Monday, his Honour Judge Howland Roberts gave his deferred judgment in the case of Rollason v. Oakes, in which the defendant claimed £50 damages for alleged interference with ancient lights in dwelling-house property in Martin Hill-street. Messrs. Hooper and Fairbairn represented the plaintiff, and Mr. W. Lees appeared for the defendant.—His honour held that the light coming from two of the windows had been materially interfered with by the wall which defendant had erected. He did not consider that the damage sustained had been great, and awarded the plaintiff £5 compensation with costs, also ordering the defendant to take down the wall.

"THE SURVEYOR FOR THE TIME BEING."—**KENDAL V. BOROUGH COUNCIL OF LEWISHAM.**—In the Court of Appeal on Wednesday, before Lord Justice Vaughan Williams, Lord Justice Romer, and Lord Justice Stirling, an appeal by the plaintiff against the decision of Mr. Justice Kekewich, reported in the BUILDING NEWS for April 10 of the present year, p. 510 last volume, was decided. The action was brought by the owner of 17 houses in Montem-road, Forest Hill, within the Metropolitan Borough of Lewisham, for a declaration that an order of the Lewisham Borough Council apportioning the paying expenses of the road between the owners of the several houses abutting thereon was void, and for an injunction to restrain the council from collecting these expenses from the plaintiff's tenants. The plaintiff's main objection to the order was that the estimated expenses of paving the road in question were determined by Mr. Ernest Van Patten, who, as the plaintiff alleged, was not at the time when the estimate was prepared by him the "surveyor," but the assistant surveyor of the defendant council within the meaning of section 105 of the Metropolitan Management Act, 1855. Mr. Justice Kekewich held that, as section 105 spoke of the "surveyor for the time being," Mr. Van Patten, though he was not the permanent surveyor, was a surveyor appointed by and acting for the board in the matter, and came within the words of the section, and his determination of the amount was valid. The action was accordingly dismissed. The plaintiff appealed. Before the conclusion of the arguments terms for the settlement of the action were suggested by the Court, and were ultimately agreed to by the parties. The precise nature of the terms was not stated. The question of costs was then argued, after which the Court ordered that the defendants should pay £75 for costs.

CHIPS.

A new Primitive Methodist Church was opened at Branch-end, near Stocksfield-on-Tyne, on Tuesday. The church has been built at a cost of about £700, on the main road from Newcastle to Carlisle. The inside measurement of the building is about 47ft. by 21ft., and it seats 200 people. The interior is fitted up with pitch-pine, and the heating process is to be with hot water. The building has been designed and erected by Messrs. G. Watson and Son, of Stocksfield.

In our notice of the new hospital, Leeds, for women and children, just recently opened, we omitted to mention that, in addition to all the other up-to-date appliances, this hospital is fitted with an electric patients' lift, by Messrs. A. Smith and Stevens, of London.

The Bishop of Llandaff dedicated, on Wednesday, a font of St. Bees stone on an Irish marble pedestal, at St. Elvan's Church, Aberdare, in memory of Lady Lewis, wife of Sir W. T. Lewis, who died on October 2, 1902.

Mr. Alfred East, A.R.A., unveiled, on Wednesday, a memorial tablet on the west wall of the south aisle of Kettering parish church, in memory of Mr. J. T. Kettlehip, the animal painter, who was born at Kettering. The tablet is of repoussé bronze on a marble slab, and was executed by Mr. George J. Frampton, R.A., as a tribute to a brother artist.

Mr. William B. Ittner, Building Commissioner for the Board of Education, and a member of the St. Louis Architectural Club, was elected President of the Architectural League of America at the late St. Louis Convention. The League also voted to hold its 1904 convention at Pittsburgh, but no date was definitely fixed.

Mr. Justice Channell gave judgment, in the King's Bench Division, on Wednesday, in a case in which the trustees and holders of land in Hilldrop-road, N., sought to recover possession of it from the London School Board. The defendants had compulsorily acquired the property for the purpose of erecting a pupil teachers' centre; but the Court of Appeal had granted a perpetual injunction restraining them from spending funds for that purpose. The Judge held that the Board could not retain the land, and gave judgment for the plaintiffs for possession, and a declaration that they were entitled to damages. Execution was stayed with a view to an appeal.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contribution.

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Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., L., LII., LIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Situations and Partnerships.

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* * * Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—T. C. F.—T. A. and Sons.—A. M. F.—S. T.—T. W. and Co., Ltd. (Guernsey).—C. S. A.—D. E.

"BUILDING NEWS" DESIGNING CLUB.

F. W. (By "Belvedere" a look-out balcony and turret is intended, but it is an optional feature. "H. M. C." means housemaid's closet.)—H. S. HOLIDAY. (Read the rules published in the BUILDING NEWS for Sept. 25 last.)—HORACE BIGGS. (Look up back numbers, and you will see how members contrive their drawings on one sheet. It is generally the case that the most indifferent contributors break the rule as to one sheet, or badly arrange their designs on one piece of paper.)

DRAWINGS RECEIVED.—"Norseman," "Stoney," "Zoccolo," "Stoop," "Musselburgh," "Obelisk," "B," "Black and White," "The Last Man In," "Ghost," "Quatre Bois" (unfinished), "Ydol," "Teaderfoot," "Markman," "Plumbbob," "Clerk," "Works," "Putrescens," "Fenland," "Black Hart," "Autocar," "Architect," "Leo," "Jingo," "Viking," "Moua," "Lavernock," "Orchid," "Woe Macgregor," "Jap," "The New Boy," "Cedric," "Inside Right," "Cast," "S. H. S." (device), "Broad Arrow," "Free Trade," "O. K.," "Spas," "Vectis," "Desperate," "Ilex," "The Kid," "Omega," "Fido," "The Magpie," "Arabiatang," "Prims," "Midnight Oil," "Liverbird" (Your name and address are perfectly illegible. Why write in so foolish a way?). "Criscross," "Iotic," "Digneori," "White Rose," "Double," "Sir Toby," "Regent," "Humber," "Pip," "Cave Canum," "D'Artagnan," "Takisara," "Old Mercer," and "Force."

The Abercarn Urban District Council have appointed Mr. John Williams, Risca, surveyor in the place of Mr. Stephens, resigned.

Correspondence.

DWELLING HOUSES: SUGGESTED PLAN BY DR. JOHN W. HAYWARD.

To the Editor of the BUILDING NEWS.

Sir,—Deliberate opinions by medical men on the planning of houses are so rare that architects cannot afford to let slip the opportunity of probing them to the bottom.

Perhaps Dr. Hayward will be so kind as to offer some further elucidations of the reasons which lie behind the many points of divergence the plan published in your issue of Sept. 25 shows from the principles which would guide any good architect in planning such a house. In the hope that Dr. Hayward will do this, I will, with your permission, touch some of these points.

Regarding the living-room, one may acquiesce in Dr. Hayward's conclusions if one assumes (since there is no scale) that the dimensions of the room are at least 25ft. by 20ft. The discomfort of having the fire and the door on the same side of a smaller room would be very great. Excepting the larder and beer cellar, and in some degree the kitchen, Dr. Hayward's remarks on the necessity for sunshine in this room should apply to the whole house; but, curiously enough, the remainder of the plan is markedly deficient in that respect.

The entrance-hall and principal corridor seem inadequate in size and wanting in dignity, and the absence of direct daylight, both here and in the back passage, would render the house dull, and in parts dark. The approach to the principal room of the house under the upper flight of the stair would be ungainly and mean; but in practice, the working out of headroom would probably result in considerable changes in the plan of the south end of the house.

The drawing-room might, as argued, be used mainly in the evening; but afternoon functions cannot be ignored, and the hygienic influence of sunlight is surely lasting and important enough to merit for this room a better aspect than north-west. The proper ventilation of the dining-room, which is in proportion a long narrow apartment, will be prevented by the greenhouse which extends across the whole width of the north-west end—its only outside wall, and this circumstance, considering the form and aspect of the room, will leave something to be desired in its lighting.

The central position of the kitchen would, I fear, disseminate the cooking smells through the house to the almost greatest possible extent, notwithstanding the closed compartment between the hall and the back passage, and this compartment, with its service hatch direct into the kitchen, and its want of light and ventilation would, I suggest, be an unpleasant, unhygienic, and unhygienic feature.

An architect would not dare, in a house of this class, to place the kitchen in a position where the morning sun would make it unbearably hot, nor to place the kitchen and butler's pantry windows where they must overlook the approach to the main entrance, nor would he be allowed to place a kitchen entrance within about 30ft. of the principal entrance.

The unusual position of the scullery, the darkness of the glass and china store, the means of access to the mistress store, are all matters which require explanation. The situation of the beer cellar in the middle of the house would no doubt secure a desirable uniformity of temperature; but, besides allowing the smell to get through the house, that advantage is discounted by the long journey the beer must make on delivery through the back passage and china store, or by the alternative route by the flower garden and the mistress store.

Many other points might be touched on, such as the ventilation of the ground floor lavatory into a greenhouse, and the matter of the provision of a servants' w.c. on the ground floor; but, of course, the plan is roughly sketched, and some of these remarks may in consequence be doing its intention an injustice. The general conception of the plan is, however, so far removed from what the utterances of medical men would lead one to expect in matters of light and ventilation, that perhaps one may be pardoned for asking a fuller explanation of its peculiarities.—I am, &c.,

Light.

At St. Luke's Church, Kingston-upon-Thames, on Monday, the vicar dedicated a stained-glass window which has been placed in the south aisle.

Intercommunication.

QUESTIONS.

[12019.]—**Scarcement**.—Will some reader enlighten me on the following point—viz. I possess a feu-charter for a piece of ground upon which a house is built. A plan accompanies the charter, with figured dimensions thereon. The sizes on plan show my ground to be contained in the space occupied by the house; but if the scarcements of 9in. be taken into account, I am entitled to the whole ground built on. The superior maintains that I am only entitled to what is above the ground level.—MARINE, Portree.

[12020.]—**Archbishop Benson's Monument, Canterbury Cathedral**.—Can any reader inform me who was the architect and who the sculptor of the memorial altar tomb and effigy of the late Dr. E. W. Benson, Archbishop 1882-93, which occupies the north wall of the north-western tower (western bay of north aisle of nave) at Canterbury Cathedral?—CHAUCERIAN PILGRIM.

[12021.]—**Temporary Building**.—In erecting a wooden building, say about 25ft. by 14ft. by 12ft. high to the eaves, and 20ft. to the ridge, if the supports are let into the ground, can the building when the tenancy expires be removed? Or does it become the property of the landlord by reason of the foundations being underground? If this is so, can you suggest a strong, but cheap, foundation resting on the ground, and one that can be removed at the end of the tenancy? Would 3in. by 2in. studs placed 1ft. apart and braced at intervals, weather-boarding tarred on the outside and mthboarded inside be sufficiently strong and waterproof for the sides? Or can a cheaper method be employed for this building, which has to be dry? Would weather-boarding be a suitable covering for the roof? The building would be erected in the country in a garden.—STUDIO.

REPLIES.

[12017.]—**Small Building**.—The answer to your seven queries is very simple, and it is, "Employ a Surveyor." It will then be his business to advise you and give you information on your buildings, and see that what you require is properly carried out.—CANTAB.

CHIPS.

The partnership hitherto subsisting between R. B. Broster and W. Broster, architects, of Keighley, Yorks, under the style of Barber, Hopkinson, and Co., has been dissolved.

On Saturday, in Dunblane Cathedral, there was unveiled a memorial-stone, commemorating the restoration of Dunblane Cathedral, begun in September 1889, finished in October 1893. The inscription is cut in black lettering on an oblong panel of white marble. Surrounding it is a shell ornament, with an acanthus leaf at each of the four corners. Outside this is a slip of black marble, while the outer frame is of dove marble, with an old Scottish moulding. The design is by Sir R. Rowand Anderson, Edinburgh, and its execution was by Mr. Birnie Rhind, A.R.S.A.

The Tylers and Bricklayers' Company give notice that a vacant almshouse and pension will be filled up at an election to be held on Tuesday, Nov. 24. Particulars may be obtained from Mr. Arthur Bird, the clerk, 6, Bedford-row, W.C.

The electrical station at Plumstead, built by the borough council of Woolwich, was formally opened on Thursday in last week. The total cost has been £90,000, of which the plant, including four miles of cables, absorbed £46,000, and the buildings for station and dust destructor £44,000. The brick-making plant, which has also been laid down, cost another £5,000. The plans and specifications for the buildings were prepared by Mr. Frank Sumner, the borough engineer of Woolwich, and those for the plant by Mr. John B. Mitchell, the borough electrical engineer.

The Bishop of Colchester preached at the re-opening on Wednesday of Alphamstone Church, Essex, after the restoration of the chancel. The work has entailed the rebuilding of a considerable portion of the fabric and the entire refitting of the chancel, which has been superintended by the architect, Mr. Arthur Blomfield Jackson. The original sedilia, which are excellent examples of early 14th-century work, have been discovered and replaced. These were broken up and the fragments built into a brick wall about 200 years ago, since when their existence was unknown till now. The autograph graffito of Nicholas le Gryce, 1578, the rector who then restored the chancel roof, has been found under a coating of plaster. Steps are in contemplation to repair the nave, which is full of good examples of 14th-century design.

The Benedictine Abbey of St. Mary Buckfast, South Devon, narrowly escaped destruction by fire on Wednesday morning. The stable and outbuildings contiguous to the church were burned down, and had it not been for the prompt assistance rendered by a fire brigade, the whole of the buildings would have been destroyed. The abbey was founded before the Conquest, was suppressed in 1533 by Henry VIII., but came into possession of the Benedictines again some 23 years since. Under the guidance of the lord abbot, the monks are rebuilding a portion of the ancient monastery.

Our Office Table.

THE rearrangement and construction of the roadways in the Mall in connection with the Queen Victoria Memorial is now in progress, under the direction of Mr. Aston Webb, R.A., P.R.I.B.A. A beginning has just been made with the work of forming the new central road and laying it with wood pavement. This road, which will centre on the statue of the Queen to be placed in the middle of the memorial opposite Buckingham Palace, will be 65ft. wide, and will extend as a thoroughfare open to the public as far as Marlborough Gate for the present, and ultimately to Charing Cross. On each side of this road there will be a double avenue of plane-trees, with a pathway for foot-passengers between each row of trees. The present wood-paved road that runs along the north side of the Mall will be converted into a gravel road for horses, 45ft. wide. On the south side the railings along St. James's Park will be set back a few feet to the grass, and in the space thus obtained a third pathway will be provided. The whole will be lighted with arc lamps placed on the avenues. This scheme involves the demolition of some of the trees at present growing in the Mall, as they occupy the line of the new central road, but in place of them new plane trees are to be planted at once to form the fresh avenues. By the beginning of February all the new trees will be planted, and the roadways and footpaths completed up to Marlborough Gate.

AN Exhibition of Art Applied to Manufactures will be held in the Shire Hall, Chelmsford, on Tuesday, Wednesday, Thursday, Friday, and Saturday, December 1, 2, 3, 4, and 5. The exhibits will embrace art manufacturing processes in operation, consisting of pillow point, Honiton, and other lace, ribbon work, embroidery, cloth weaving, leather embossing. Demonstration of natural colour photography, artistic lead-glazing, wood-carving and sculpture, mosaic manufacture, clay modelling, manufacture of pottery and potter's wheel, &c. Exhibits of art manufactures: Lace, art needlework, embroidery, damasks, silk brocades, and other art fabrics, artistic furniture fittings and hangings, art joinery, mantels, and enriched mouldings; valuable books and bindings, art publications, art pianos, ornamental glass of every description. There will also be on view a model of the Westminster Cathedral, exhibited in public for the first time at this exhibition, made under the direction of the late Cardinal Vaughan; art tiles and pottery, ornamental moulded bricks, electric-light fitting, art glass and metalwork, Doulton ware, art china, Japanese decoration, &c. Arrangements are being made for students of Chelmsford art classes to be seen at work, illustrating the various interesting processes of leather embossing, clay-modelling, decorative stencil work, silk and fabric decoration, gesso work, brush decoration, block designing, cutting and hand-colour printing, inlay and intarsia, weaving, art needlework, tile and pottery designing and making, &c.

ON the occasion of the Royal visit to the workmen's dwellings, erected by the London County Council on the Millbank estate, her Majesty the Queen suggested that the provision of more cupboard space would be a boon to the tenants. The Housing of the Working Classes Committee reported on Tuesday to the London County Council that, recognising the usefulness of the suggestion, they had decided to begin by having cupboards constructed in the tenements in Adelaide, Sydney, and Melbourne buildings, which had previously been erected on the Ann-street estate, Poplar. This work had now been completed, and they were taking steps to insure the provision of good cupboard space in all the Council's dwellings. In view of the great interest shown by their Majesties the King and Queen in the question of the housing of the working classes, they recommend that their Majesties should be informed of the action taken by the Council in this matter.

THE Winchcombe Rural District Council, on Saturday, had a discussion about the semi-parish church at Southam-de-la-Bere, near Cheltenham, the mansion adjoining having been the residence of the first Earl of Ellenborough. The church is situated in a farmyard, and the only way to it is through the farmyard. Its surroundings, therefore, are not of an ecclesiastical character, and the outside of the building is plain; indeed, it is

said that it was originally nothing but an agricultural barn. Entering the church, however, a stranger is astonished, as the decorations are very profuse, and there are many pictures, statuettes, and ornaments displayed upon its walls and upon brackets set up in every corner and crevice. The solicitors to the estate have made application for the repair of the short bit of road through the farmyard to the church; but the surveyor said the road is not to be found on the parish award or map, neither was the church ever marked there. Mr. Griffiths, the local councillor, said the rectors of Bishop's Cleeve had always officiated there every Sunday, and he thought the road should be repaired for the benefit of the public. Without evidence of liability, however, the surveyor, was instructed not to do anything.

The Lord Bishop of Southwell, Dr. Ridding, unveiled and dedicated, on Monday, a stained-glass memorial window just placed at the east end of the parish church of Hartshorn, to perpetuate the memory of the late Rev. H. W. Buckley, a past rector of the parish. The church, which dates back to the 13th century, has recently been restored at a cost of £2,600.

The consideration of the plans for new baths on Liverpool Pierhead, prepared by Mr. A. Saxon Snell, of London, and provisionally selected in competition, has been adjourned till the December meeting of the city council. The work is estimated to cost £70,000.

The Isolation Hospital for the urban district council of Chiswick is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke-flues and Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

In reference to the correspondence which has appeared in the *Times* and other papers regarding Frosterley marble, we are informed that Messrs. Emley and Sons, Ltd., Newcastle-on-Tyne, have at all times this marble in stock, and are at present supplying it to the new Roman Catholic church at Norwich. They will be pleased to forward a sample on application.

Mr. E. A. Sandford Fawcett, A.M.Inst.C.E., Local Government Board inspector, held an inquiry last week into the application of the Hornsey Urban District Council for sanction to borrow £39,700 for the reconstruction of part of the Highgate Low level outfall sewer which collapsed during the heavy storms of August and September last. Mr. E. J. Lovegrove, the surveyor, explained the plans.

Mr. C. H. Mileham, of London, is the architect, and Mr. G. Kemp, of Aldershot, the builder, of the new church at Badshot Lea, Aldershot, opened last week.

A system of sewerage is about to be provided for the parish of Farnborough and small portions of Chelsheld and Orpington parishes by the Bromley Rural District Council, at a cost of between £7,000 and £8,000. The necessary order has been granted by the Local Government Board.

According to the current issue of *Indian Engineering*, Mr. James Ransome, F.R.I.B.A., consulting architect to the Government of India, will be relinquishing his appointment shortly to return to England.

The Emperor William has commissioned the sculptor, Professor Haverkamp, to produce a memorial to the late Herr Alfred Krupp, which is to be placed in front of the Imperial Yacht Club House at Kiel.

The altar-tomb for the grave of the late Dean of Winchester, Dr. Stephens, the cost of which is being defrayed by subscription, will be unveiled on Dec. 22, the anniversary of his death.

Mr. Thos. F. Shaw, architect and surveyor, of 60, Nichol-road, Harlesden, was found dead in his bed on Tuesday. He was an old resident, and had planned many of the new roadways and public buildings of the district, including the Harlesden Constitutional Club, of which he was a founder and a director.

The new corporation fire brigade station and depot, situated in New-street, Burton-on-Trent, was formally opened on Friday. The cost of construction was £6,000 for the station proper, and £4,250 for the depot. It has been built under the direction of the borough engineer and surveyor, Mr. G. T. Lynam.

The Bishop of Oxford on Thursday in last week laid the foundation-stone of a new chancel to the parish church at Loudwater, Bucks. The church has never been altered since it was erected in 1789, and retains its old-fashioned "three-decker" pulpit and reading-desk and uncomfortable high-backed pews. With the building of the chancel, the whole of the church and its furniture will be modernised, the total cost being £2,000.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. Opening Address by the President, Albert Buck. 8 p.m.

Clerks of Works Incorporated Association. "The Carpenter: His Tools and his Work," by John Davies, Carpenters' Hall. 8 p.m.

TUESDAY.—Architectural Association Camera Club. Presidential Address by F. R. Taylor. Lecture on "Little Known Irish Abbeys," by C. H. Oakden. 56, Great Marlborough-street, W. 7.30 p.m.

Institution of Civil Engineers. "Tensile Tests of Mild Steel," by Prof. W. C. Unwin, F.R.S. 8 p.m.

WEDNESDAY.—Edinburgh Architectural Association. "Notes on Later Scotch Gothic," by Ramsay Traquair. 8 p.m.

Northern Architectural Association. Opening Address by the President, J. Walton Taylor. 7.30 p.m.

THURSDAY.—Sheffield Society of Architects and Surveyors. "Architectural Education," by Hugh Stannus, F.R.I.B.A.

THE ARCHITECTURAL ASSOCIATION.

NOVEMBER 6th: ORDINARY GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. PAPER by Mr. C. A. NICHOLSON on "Modern Churches." LOUIS AMBLER } Hon. Secs.
H. TANNER, Jun. }

CHIPS.

At the municipal offices, Liverpool, on Saturday, Mr. James Cooper, chief sanitary inspector, was the recipient of a marble clock and a pair of bronze ornaments on his retirement on superannuation, after 31 years' service in the Liverpool Corporation. Dr. Hope, medical officer of health for the city, made the presentation.

A presentation portrait of Sir James Hoy, painted by Sir George Reid, has been added to the collection in the Manchester City Art Gallery. Other recent gifts to the gallery are a portrait of Sir Benjamin Heywood and a landscape by Vannini.

It was announced on Saturday that the Local Government Board have decided against the Malton Urban District Council respecting their dispute with Earl Fitzwilliam in regard to the repair of a portion of Railway-street.

A memorial window to the late Colonel David Milne Home of Wedderburn was unveiled in Coldingham parish church on Saturday. The central portion is heraldic in design, displaying the armorial bearings of the Homes of Wedderburn. Above the dedicatory words are inscribed "Remember" and "True to the End"; and the whole is surmounted by the words from the Book of Revelation, "Be thou faithful unto death, and I will give thee a crown of life," inclosing a crown and star. The window was designed by Mr. Robert Home, Frederick-street, Edinburgh.

The ceremony of screwing the commemorative pile of the new pier now being erected by the Weston-super-Mare Grand Pier Co. will be performed to-morrow (Saturday) by Mr. R. E. Dickenson, M.P.

Mr. E. J. Bennett, A.R.I.B.A., has been appointed by the town council of Gravesend as architect for the proposed free library in that town.

Messrs. Stones and Stones ask us to mention that Mr. Edwardes Sproat, of Glasgow, was associated with them as joint architect in preparing the competition design submitted for tramway offices, &c., at Liverpool.

On Saturday afternoon the Suffragan Bishop of Leicester (Dr. Clayton) dedicated a new peal of five bells at St. Peter's church, Aldwinckle. The bells replaced a set of three, one of which had long been cracked, and have been provided by Messrs. John Taylor and Co., of Loughborough.

On Wednesday week, Mr. R. J. Reece, M.D., an inspector of the Local Government Board, held an inquiry into the applications of the Burslem Town Council for sanction to borrow £13,000 for the provision of an infectious diseases hospital, and £275 for the provision of a disinfecting station and apparatus. The plans were submitted and explained by the architect, Mr. Reginald T. Longden, Moorland-road, Burslem, whose design was selected in competition. The buildings include two twelve-bed pavilions for scarlet fever and typhoid cases respectively, and a similar pavilion with a single-bed separation ward for diphtheria; there are also an isolation block of two wards, porter's lodge, administration block for matron, eight nurses, and eight servants, steam laundry, disinfecting-station, and mortuary.

Mr. W. O. S. Meade King, C.E., Local Government Board inspector, held an inquiry at Thurnscoe on Friday, when Mr. F. E. Nicholson, on behalf of the rural district council and parish council of Thurnscoe, applied for sanction to borrow £3,234, required for a water scheme, stating that the population had grown from 271 in 1891 to 2,366 in 1901. There was no opposition.

LIST OF COMPETITIONS OPEN.

Skewen—Public Library (limit £2,000)	£10 10s.	Samuel Jones, Clerk, Old-road, Skewen, Neath	Nov. 9
Kilmarnock—Tenement of Shops and Workmen's Houses	£15 15s., £10 10s., £5 5s.	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	" 9
Newport, Mon.—Sewerage Scheme		T. S. Edwards, Clerk, 24, Stow Hill, Newport, Mon.	" 11
Sunderland—Additions to Town Hall	£100, £50, £25	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	" 21
Bray—Pavilion and Winter Gardens	£30, £15, £10, and three of £5 5s.	Frank Bethell, Hon. Sec., Town Hall, Bray	" 30
Wakefield—Reconstructing Cattle Market	50gs. (merged), 25gs.	R. Ernest Langhouse, Solicitor, Wakefield	Dec. 1
Elgin—School (340 places)		Hugh Stewart, Clerk, Elgin	" 7
Selly Oak—Public Baths (Assessor)		A. W. Cross, A.M.I.C.E., 23, Valentine-road, King's Heath	" 7
Herne Hill, S.E.—Public Library		H. J. Smith, Clerk, Lambeth Town Hall, Kennington Green, S.E.	" 16
Windsor—Elevations for Police and Fire Brigade Stations	25gs.	E. A. Stickland, A.M.I.C.E., Borough Surveyor, Windsor	Jan. 15
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Com.-Gen., 22, Laurence-Pountney-lane, E.C.	Mar. 31
Liverpool—Cotton Exchange (Local Architects)		Peter Brown, Sec., 50, Broad's Buildings, Liverpool	"
Oldham—Board School		J. Rennie, Clerk, School Board Offices, Oldham	"
Llwynypia—Workmen's Hall (1,500 seats)		The Secretary, Workmen's Institute, Llwynypia, Wales	"
Fraserburgh—Infectious Diseases Hospital and Public Library		William Alexander, Burgh Surveyor, Fraserburgh	"
Rhyl—Pavilion (10,000 places) at National Eisteddfod		H. A. Tilby and J. W. Jones, Gen. Secs., Town Hall, Rhyl	"

LIST OF TENDERS OPEN.

BUILDINGS.

Hemel Hempstead—Rebuilding Premises, 85, High-street	George Rolph	Sydney Dawe, A.R.I.B.A., High-street, Rickmansworth	Nov. 7
Windsor—Shop and House, St. Leonard's-road		Percy H. Grove, Architect, 14, Alma-road, Windsor	" 7
Alnwick—Two Villas, Swansfield Park-road		Wm. Robson Hindmarsh, Architect, Alnwick	" 7
Stoke Gabriel—Stable at Lower Well Farm	Col. R. W. Studdy	W. F. Tollit, Totnes	" 7
Barrow-in-Furness—Sailors' Home on Barrow Island		C. Mossop, Hon. Secretary, Furness Railway, Barrow	" 7
Newcastle-on-Tyne—Two Five-Storied Warehouses		Arthur Stockwell, Archt., 11, Pilgrim-street, Newcastle-on-Tyne	" 9
Horsforth, Leeds—House and Shop	David Emmett	Percy Robinson, Architect, 53, Albion-street, Leeds	" 9
Aberystwyth—Additions to Nantyglo School	School Board	R. L. Roberts, Architect, Abercrombie	" 9
Middlebrough—Slaughter House	Co-operative Society, Ltd.	Moore and Archibald, Architects, 27, Albert-road, Middlesbrough	" 9
Leeds—Extensions of Workhouse Hospital		Thomas Winn and Sons, Architects, 92, Albion-street, Leeds	" 9
Haverstock Hill, N.W.—Hospital	Hampstead General Hosp. Committee	Young and Hall, Archts., 17, Southampton-st., Bloomsbury, W.C.	" 9
Elgin—Additions to East End and West End Schools	School Board	John Wittet, Architect, Elgin	" 9
Leeds—Factory, Hanover-lane	John Barran and Sons, Ltd.	W. Carby Hall and Dalby, Architects, Park-row, Leeds	" 9
Norwich—Additions to Workhouse Laundry	Guardians	Morgan and Buckingham, Architects, Norwich	" 9
Leicester—Government Offices	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 10
Wallingford—Isolation Hospital	Joint Hospital Board	S. Couch-Johns, M.S.A., Land Chambers, Reading	" 10
Holsworthy—Carpentry Work at Infirmary	Guardians	Claude Kinsman, Clerk, Union Offices, Holsworthy, Devon	" 10
Limerick—Laundry, Chimney Shaft, &c., at Workhouse	Board of Guardians	H. J. Guinane, Union Clerk, Limerick	" 10
Southampton—Additions to Ordnance Survey Offices	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 10
Lower Sydenham—Branch Library	Lewisham Public Libraries Com.	J. R. Vining, 89, Chagery-lane, W.C.	" 10
Moss Side—Fire Station	Urban District Council	Henry B. Longley, A.M.I.E.E., Surveyor, Moss Side, Lancs	" 11
Penycoedcae—Twelve Houses	Building Club	Alfred Bryant, Architect, Midland Bank Buildings, Pontypridd	" 11
Cardiff—Additions to Pembroke-terrace Chapel	Welsh Calvinistic Methodists	Thomas Thomas, Accountant, 29, Queen-street, Cardiff	" 11
Levenshulme—Additions to Council Offices	Urban District Council	James Jepson, Architect, Tiviot Dale, Stockport	" 11
Norwood—Repairs to School Infirmary	Lambeth Guardians	W. Thurnell, Clerk, Brook-street, Kennington-road, S.E.	" 11
St. Columba—Reconstructing Workhouse Infirmary	H.M. Commissioners of Works	C. E. Whitford, Clerk, St. Columb	" 11
Manchester—Telephone Exchange, Quay-street	Guardians	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 11
Antrim—Dispensary and Residence	Urban District Council	N. Fitzsimons, A.R.I.B.A., 82, Royal-avenue, Belfast	" 12
Herne Bay—Alterations and Additions to Town Hall		F. W. J. Palmer, C.E., Surveyor, Town Hall, Herne Bay	" 12
Darfield—Cloakroom, &c., at National School	Wallasey Education Committee	A. B. Linford, Architect, Carlton Villa, Wombwell, Yorks	" 14
Liscard—School (1,000 places), Manor-road	Urban District Council	Edmund Kirby, F.R.I.B.A., 5, Cook-street, Liverpool	" 14
Ebbw Vale—Altering Building into Fire Station	Urban District Council	J. Thomas, Town Surveyor, Ebbw Vale	" 16
Chadderton—Library, Middleton-road	Urban District Council	Groome and Lindsay Grant, Archts., 2, St. Peter's-sq., Manchester	" 16
Middleton—Gable Ends, Dane-street	Corporation	W. Welburn, Boro' Surveyor, Middleton, Lancs	" 16
Ebbw Vale—Caretaker's House	Urban District Council	J. Thomas, Town Surveyor, Ebbw Vale	" 16
Castletownbere—Additions to Premises		Saml. F. Hynes, F.R.I.B.A., 71, South Mall, Cork	" 16
Norampton—Additions to Police Station	West Riding County Council	J. Vickers Edwards, County Architect's Office, Wakefield	" 16
Bradford—Enlargement of Central Offices, Manor-row	Guardians	Emmott and Clarkson, 7, Exchange, Bradford	" 16
Seelley, Salford—Terracotta for School, West Liverpool-street	Education Committee	Henry Lord, F.R.I.B.A., Architect, 42, Deansgate, Manchester	" 17
Pontnewydd—Gallery in Richmond-road Baptist Chapel	Guardians	L. D. Jones, Cromwell-place, Pontnewydd, Wales	" 19
Nantwich—Workhouse Infirmary and Nurses' Home	Dalton-in-Furness U.D.C.	C. E. Davenport, Architect, 152, Victoria-street, Nantwich	" 19
Lindal-in-Furness—Branch Library	Education Committee	W. Richardson, Surveyor, Council Offices, Dalton	" 20
Newcastle-on-Tyne—Extensions, Arthur's Hill Council School	Admiralty	Alfred Goddard, Sec., Education Offices, Newcastle-on-Tyne	" 20
Felixstowe—House at Coastguard Station	Education Committee	The Coastguard Station, Felixstowe	" 20
Portsmouth—School, Reginald-road	Building Committee	G. E. Smith, Architect, 145, Victoria-road North, Southsea	" 20
Blackpool—All Saints Church	Surplus Lands Committee	Frank H. Gurst, Architect, 7, Birley-street, Blackpool	" 23
Sheffield—Salesshops and Artisans' Dwellings, Snig Hill	Guardians	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	" 23
Droxford—Repairs to Master's Office at Workhouse	Education Committee	Francis Clark, Clerk, Bishop's Waltham, Hants	" 23
Tottenham, N.—Altering Lancasterian Schools, Church-road	Urban District Council	G. E. T. Laurence, Architect, 22, Buckingham-street, Adelphi, W.C.	" 28
Knaresborough—Purifier House	Urban District Council	J. E. Walker, Surveyor, Town Hall, Knaresborough	Dec. 4
Birkdale—Hospital	Urban District Council	J. F. Keeley, Clerk, Town Hall, Birkdale, Lancs	"
Sheffield—Fifty Workmen's Cottages	Midland Railway Co.	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	"
Bradford—House, &c., Canal-road		Aird and Calder, Navigation Offices, Dock-street, Leeds	"
Newhaven—Altering Primitive Methodist Chapel	Burial Board	F. J. Rayner, Architect, Port-road, Newhaven, Sussex	"
Knaresborough—Two Semi-Detached Houses	Jabez Cole	Wm. Driffield, Architect, Boroughbridge-road, Knaresborough	"
Pinner—Restoration of Chapels	Peter Blyth	Harrison and Ward, 66, Victoria-street, Westminster, S.W.	"
Liphook, Hants—Country Residence, Cottage, and Stabling		J. A. Souttar, Architect, 41, Bishopsgate-street Within, E.C.	"
Menston—Two Pairs of Semi-Detached Villas		William H. Sharp, Architect, 239, Rensley-lane, Bradford	"
Adel, Leeds—Detached Cottages		George W. Atkinson, Architect, 1, Mark-lane, Leeds	"
Hooley Hill—Office and Stable		Burton and Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	"
Newport—Arcade Premises, High-street		Habershon, Fawcner, & Co., Archts., 41, High-st., Newport, Mon.	"
Horden Colliery—House and Shop		W. A. Noble, The Colliery, Castle Eden, R.S.G., Durham	"
Ebbw Vale—Rebuilding Shops and Premises		B. J. Francis, Architect, Abergavenny	"
Humberstone—Small Farmhouse on Carrington Estate		J. Carter Jonas and Sons, Estate Agents, Cambridge	"

ELECTRICAL PLANT.

Wakefield—Two-Phase Generator (400-kw.)	Town Council	The City Electrical Engineer, Calder Vale-road, Wakefield	Nov. 7
Glasgow—Wiring Premises	May-Oatway Fire Appliances, Ltd.	The Managing Director, 49, Queen-street, Glasgow	" 7
Beckenham—Electric Wiring Houses	Urban District Council	John A. Angell, Surveyor, Council Offices, Beckenham	" 9
Derby—Telegraph Instruments	Midland Railway Co.	Alfred Derry, Stores Superintendent, Derby	" 10
Blackadon—Electric Lighting Borough Asylum	Corporation	E. G. Okell, Boro' Elec. Eng., Prince Rock, Plymouth	" 14
Radcliffe—Electric Lighting	Urban District Council	Lacey and Sillar, Engineers, 2, Queen Anne's Gate, S.W.	" 14
Blackpool—Traction Set	Electricity and Tramways Committee	Charles Furness, Borough Electrical Engineer, Blackpool	" 14
Swindon—Overhead Equipment	Corporation	Lacey and Sillar, Engineers, 78, King-street, Manchester	" 16
Harrogate—Trunk Mains	Corporation Electricity Dept.	Geo. Wilkinson, M.I.M.E., M.I.E.E., 33, Swan-road, Harrogate	" 16
Darenth—Installing Telephones at Asylum	Metropolitan Asylums Board	W. T. Hatch, A.M.I.C.E., M.I.M.E., Embankment, E.C.	" 17
Kilmarnock—Plant	Corporation	Kennedy and Jenkin, Engineers, 17, Victoria-street, Westminster	" 18
Wednesbury—Electric Lighting Public Buildings	Town Council	F. J. Warden-Stevens, A.M.I.M.E., 34, Victoria-st., Westminster	" 20
Edinburgh—Electric-Light Installation at Police Station	Urban District Council	The Resident Electrical Engineer, Dewar-place, Edinburgh	" 21
Hornsey—Meters, &c.		Norman Staniland, Electricity Works, Tottenham-lane, Hornsey	" 30
Colombo, Ceylon—Electrical Energy		The Office of the Colonial Secretary, Colombo	Dec. 1
Sydney—Telegraph Materials		The Deputy Postmaster-General, Sydney, New South Wales	" 30
Handforth, Manchester—Electric Motor	Chorlton-on-Medlock Guardians	G. R. Peers, A.M.I.E.E., 16, John Dalton-street, Manchester	"

ENGINEERING.

Hamilton—Stone Bridge	County Lanark District Committee	W. L. Douglass, C.E., District Engineer, District Offices, Hamilton	Nov. 7
Bridlington—Parade Extension Works	Corporation	Ernest R. Matthews, Borough Engineer, Town Hall, Bridlington	" 7
Dundee—Tar Boiler, &c.	Town Council	H. Richardson, City Elec. Eng., Dunhope-crescent-rd., Dundee	" 7
Alnwick—Wooden Footbridge over Burn	Rural District Council	H. W. Walton, Clerk, Alnwick	" 9
Leeds—Heating Workhouse Hospital Extension	First Garden City, Ltd.	Thos. Winn and Sons, Architects, 92, Albion-street, Leeds	" 9
Halduck—Borehole	Corporation	G. R. Strachan, M.I.C.E., 7, Victoria-street, S.W.	" 9
Yeovil—Laying Cast-Iron Socket-Pipes (6 miles)	Board of Guardians	T. and C. Hawksley, C.E.s., 30, Great George-street, S.W.	" 9
Limerick—Laundry Machinery Appliances at Workhouse	Urban District Council	H. J. Guinane, Union Clerk, Limerick	" 10
Wellingborough—Steam-Roller (10-ton)		J. T. Parker, Clerk, 23, Church-street, Wellingborough	" 10

ENGINEERING—continued.

Plymouth—Fitting Steel Boiler Tube	Guardians	Wm. Adams, Clerk, 13, Princess-square, Plymouth	Nov. 10
Letterkenny—Steam Economisers	Town Council	Dr. Moore, Med. Supt., Donegal District Asylum, Kilkenny	" 10
Gravesend—Cast-Iron Water Storage Tank (15,000 gal.)	Board of Guardians	C. F. McJones, Electricity Works, Gravesend	" 10
Limerick—Heating Workhouse by Steam	Urban District Council	H. J. Guineane, Union Clerk, Limerick	" 10
Winsford—Trench (3,77 yards)	West Ham Union Guardians	James Wilkinson, Surveyor, Market-place, Winsford, Cheshire	" 11
Leytonstone—Refrigerating Plant	Nocton Drainage Trustees	Fred E. Hilleary, Clerk, Workhouse, Leytonstone, N.E.	" 11
Lincoln—Repairation of Nocton Delph Bank (2½ miles)	West London Schools Managers	Thropp and Harding, Engineers, 29, Broadgate, Lincoln	" 11
Ashford, Middlesex—Well (300ft. deep)	Corporation	G. Midgley Taylor, 27, Great George-street, Westminster, S.W.	" 12
Glasgow—Three Weighbridges	Guardians	The Office of Public Works, 54, Cochrane-street, Glasgow	" 14
Mountmellick—Cooking Apparatus at Workhouse	Bulth Rural District Council	R. Goodbody, Clerk, Workhouse, Mountmellick, Ireland	" 14
Llanwrtyd Wells—Storage Reservoir (262,500 gallons)	Docks Committee	R. L. Bamford, Surveyor, Wildemars-street, Hereford	" 16
Bristol—Double-Decked Opening Bridge over River Avon	Town Council	W. W. Squire, Engineer, Cumberland-road, Bristol	" 13
Grangemouth—Waterworks	Urban District Council	Warren and Stuart, Civil Engineers, 94, Hope-street, Glasgow	" 13
Ebbw Vale—Sinking Trial Holes	Urban District Council	T. J. Thomas, Town Surveyor, Ebbw Vale	" 16
Leeds—Heating Plant at Offices and Workshops	District Committee	The City Engineer's Office, Municipal Buildings, Leeds	" 16
Bilston—Heating Town Hall	Port of Rangoon Commissioners	J. P. Wakeford, A.M.I.C.E., Town Hall, Bilston	" 17
Linthgow—Waterworks	Corporation	W. A. Tait, C.E., 72A, George-street, Edinburgh	" 17
Rangoon—Screw Pile Wharf	Rural District Council	Ogilvy Gillanders and Co., Sun-court, 67, Cornhill, E.C.	" 17
Kilmarnock—Three Lancashire Boilers	Urban District Council	Kennedy and Jenkin, Engineers, 17, Victoria-street, Westminster	" 18
Leeds—Bridge over Wortley Beck, Brown-lane	Ministry of Public Works	The City Engineer's Office, Municipal Buildings, Leeds	" 18
Rochford—Waterworks	Corporation	H. T. Sidwell, Engineer, Rochford, Essex	" 23
Horwich—Reservoirs	Corporation	Peter Taberner, Clerk, Council Offices, Horwich	" 25
Palencia, Spain—Waterworks	Corporation	The Directorate-General, Local Administration, Madrid	" 30
New York, U.S.A.—Tunnels from Sixth Avenue to East River and Long Island City	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	Dec. 13
New York, U.S.A.—Tunnels under Thirty-second-street, Manhattan, and North (Hudson) River	P., N.Y., and L.I. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
New Jersey, U.S.A.—Tunnels under Bergen Hill and North (Hudson) River	P., N.J., and N.Y. Railroad Co.	Jacobs and Barringer, 78, Gracechurch-street, E.C.	" 15
London, S.E.—Tunnel Between Rotherhithe and Ratcliff	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	Jan. 19
Cairo—Three Road Bridges over the Nile	Ministry of Public Works	The Com. Intel. Branch, Board of Trade, 50, Parliament-street, S.W.	Feb. 1
Ipswich—Extension of Water-Main at Borough Asylum	Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	"

FENCING AND WALLS.

Fulham—Dwarf Boundary Walls at South Park	Borough Council	Francis Wood, M.I.C.E., Boro' Engineer, Town Hall, Fulham	Nov. 9
Derby—Timber Fencing	Midland Railway Co.	Alfred Derry, Stores Superintendent, Derby	" 10
Enfield—Wrought-Iron Unclimbable Fencing	Urban District Council	Richard Collins, Surveyor, Public Offices, Enfield	" 11
Lancaster—Stone Wall	Streets Committee	J. C. Mount, Boro' Sur., Town Hall, Lancaster	" 14
Warwick—Iron Fencing at Workhouse	Guardians	F. R. Trepass, 1, Church-street, Warwick	" 16
Middleton—W.I. Railings at Rhodes Recreation Ground	Corporation	W. Welburn, Boro' Surveyor, Middleton, Lancs	" 18
Bootle—Dwarf Brick Wall, Stanley Garden	Corporation	B. J. Wolfenden, A.M.I.C.E., Borough Engineer, Bootle, Lancs	" 18
Hindley—Palisade Wall near Grammar School	Urban District Council	Alfred Holden, A.M.I.C.E., Surveyor, Council Offices, Hindley	" 21
Morpeth—Concrete Retaining Wall	Rural District Council	J. Murray McGregor, Highway Surveyor, Market-place, Morpeth	"

FURNITURE AND FITTINGS.

Canterbury—Furniture to Asylum	Guardians	The Storekeeper, Asylum, Canterbury	Nov. 9
Holsworthy—Furnishing New Infirmary	Urban District Council	Claude Kinsman, Clerk, Union Offices, Holsworthy, Devon	" 11
Goole—Furnishing Offices	Urban District Council	C. O. Baines, Town Surveyor, Goole, Yorks	" 10
Herne Bay—Iron and Glass Verandah at Town Hall	Urban District Council	F. W. J. Palmer, C.E., Surveyor, Town Hall, Herne Bay	" 12
Downpatrick—Fifty Bedsteads to Down Lunatic Asylum	Corporation	Samuel Rea, Clerk, Downpatrick	" 19

PAINTING.

West Hartlepool—Interior of Board Schools	Education Committee	J. Robson Smith, Sec., Education Offices, Park-rd., West Hartlepool	Nov. 7
Alnwick—Two Villas	Overseer	Wm. Robson Hindmarsh, Architect, Alnwick	" 7
Bristol—Vestry Hall, Penwell-road	John Barran and Sons, Ltd.	The City Valuer, Council House, Bristol	" 7
Leeds—Factory, Hanover-lane	Guardians	W. Carby Hall and Dalby, Architects, Park-row, Leeds	" 9
Wakefield—Interior of Workhouse	D. Emmett	H. Beaumont, Clerk, 47, Kirkgate, Wakefield	" 9
Horforth, Leeds—House and Shop	School Board	Percy Robinson, Architect, 53, Albion-street, Leeds	" 9
Elgin—East and West End Schools	Corporation	John Wittet, Architect, Elgin	" 9
Harrogate—Royal Bath Hospital & Rawson Convalescent Home	West Suffolk Education Committee	B. Shaw, Secretary, Harrogate	" 11
Middleton—Three Houses		W. Welburn, Boro' Surveyor, Middleton, Lancs	" 18
Lavenham—Schools		J. Owen Stead, Long Melford	" 17

PLUMBING AND GLAZING.

Leeds—Workhouse Hospital Extension	Guardians	Thos. Winn and Sons, Architects, 92, Albion-street, Leeds	Nov. 9
Downpatrick—Bathroom Accommodation		R. L. Morrow, Clerk, Downpatrick	" 14
Horbury—Eight Houses		Richard Sutcliffe, Horbury, Yorks	"

ROADS AND STREETS.

Fulham—Wood Paving (350' super. yards)	Borough Council	Francis Wood, M.I.C.E., Boro' Engineer, Town Hall, Fulham	Nov. 9
Lewisham, S.E.—Widening Hither Green-lane	Urban District Council	R. Stewart, Manager, Corbett Estates Office, 24, Sloane-sq., S.W.	" 9
Bingley—Paving and Flagging Robertshaw-street	Wallassey Urban District Council	H. Bottomley, Surveyor, Town Hall, Bingley	" 9
Liscard—Forming Kimberley-road	Corporation	The Surveyor, Public Offices, Egremond	" 10
Keighley—Paving Streets	Urban District Council	W. H. Hopkinson, A.M.I.C.E., Borough Engineer, Keighley	" 10
Barking—Street Works	Borough Council	C. F. Dawson, Surveyor, Public Offices, Barking	" 10
Lewisham, S.E.—Keighley, &c., Marsala-road	Wallassey Urban District Council	The Surveyor's Department, Town Hall, Catford, S.E.	" 10
Leeds—Paving and Flagging Brown-lane	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	" 10
Liscard—Making-up Imperial-avenue	Westminster City Council	The Surveyor, Public Offices, Egremond	" 10
Barrow-in-Furness—Constructing Streets	Urban District Council	The Borough Engineer, Town Hall, Barrow-in-Furness	" 11
Long Acre, W.C.—Paving (5,500 yards super.)	Urban District Council	The Works Dept., Westminster City Hall, Charing Cross-rd., W.C.	" 11
Wimbledon—Making-up Spencer-road	Corporation	C. H. Cooper, M.I.C.E., Council Offices, Broadway, Wimbledon	" 14
Blackpool—Private Street Works	Urban District Council	John S. Brodie, Borough Surveyor, Town Hall, Blackpool	" 14
Wimbledon—Making-up Cliveden-road and Merton Hall-road	Streets Committee	C. H. Cooper, M.I.C.E., Council Offices, Broadway, Wimbledon	" 14
Lancaster—Street Works	Urban District Council	J. C. Mount, Borough Surveyor, Town Hall, Lancaster	" 14
Wimbledon—Making-up Rayleigh-road	Rural District Council	C. H. Cooper, M.I.C.E., Council Offices, Broadway, Wimbledon	" 14
Uttoxeter—Road, &c.	Streets Committee	J. Preston, Surveyor, Woodlands, Uttoxeter	" 16
Wolverhampton—Street Works	Town Council	The Borough Engineer's Office, Town Hall, Wolverhampton	" 16
Croydon—Repair of Woodville-road	Poplar Borough Council	The Borough Road Surveyor's Office, Town Hall, Croydon	" 17
Bow, E.—Making-up Cross-street	Urban District Council	The Borough Surveyor, Council Offices, High-street, Poplar	" 18
New Mills—Laying Grit Sets (1,500sq. yd. of 7in.)	Borough Council	Joseph Pollitt, Clerk, Town Hall, New Mills	" 18
Poplar, E.—Making-up British-street and Cahir-street	Corporation	The Borough Surveyor, Council Offices, High-street, Poplar	" 18
Bootle—Stone Steps to Terraces	Paving Committee	B. J. Wolfenden, A.M.I.C.E., Borough Engineer, Bootle, Lancs	" 18
Manchester—Street Works		The Surveyor's Office, Town Hall, Manchester	" 19
Surbiton—New Road		Walter E. Hewitt, Surveyor, 22, Buckingham-street, W.C.	"

SANITARY.

Hipperholme—Main Pipe Sewers (2,325 yards)	Urban District Council	Frank Massie, A.M.I.C.E., Tetley House, Kirkgate, Wakefield	Nov. 7
Farnborough—Sewer	Urban District Council	J. E. Hargreaves, Surveyor, Town Hall, Farnborough	" 9
Hull—Sewer, &c.	Sealecotes Rural District Council	Wellsted and Easton, Prince's Dock Chambers, Hull	" 9
Whitehaven—Rearrangement of Drainage	Parton and Harrington Breweries	W. Carmichael, Architect, Parton, Whitehaven	" 12
Middleton—Lavatory and Urinal	Corporation	W. Welburn, Boro' Sur., Town Hall, Middleton, Lancs	" 16
London, E.C.—Brick Sewer, Eldon-street	Streets Committee	The Engineer, Public Health Department, Guildhall, E.C.	" 17
Market Bosworth—Sewerage Works	Rural District Council	Morton Sykes, Surveyor, Market Bosworth	" 17
London, E.C.—Pipe Sewer, Knightbridge-court	Streets Committee	The Engineer, Public Health Department, Guildhall, E.C.	" 17
Seisdon—Sewers, &c.	Rural District Council	R. E. W. Berrington, M.I.C.E., Bank Buildings, Wolverhampton	" 20
Bury St. Edmunds—Sewerage Works	Corporation	G. R. Strachan, M.I.C.E., 7, Victoria-street, Westminster, S.W.	" 23
Belper—Sewage Outfall Works	Urban District Council	C. J. Lomax, A.M.I.C.E., Alliance Bldgs., 37, Cross-st., Manchester	" 27
Lichfield—Sewerage Works	Corporation	Elliot and Brown, Engrs., Burton Bldgs., Parliament-st., Nottingham	" 28
Dedworth—Brick Culvert	Urban District Council	George Strutt, Surveyor, High-street, Dedworth, Yorks	" 28
Barrow-in-Furness—Conveniences, Abbey-road	Corporation	The Borough Engineer, Town Hall, Barrow	"

STEEL AND IRON.

Dublin—Rails (4,000 tons)	Great Northern (Ireland) Railway Co.	T. Morrison, Secretary, Amiens-street Terminus, Dublin	Nov. 9
Harris-mith—Galvanised Iron Buildings	Town Council	Morley and Dawbarn, 82, Victoria-street, S.W.	" 9
Belfast—Plate and Bracket Girders	Great Northern (Ireland) Railway Co.	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin	" 9
Yeovil—Cast-Iron Pipes (6 miles)	Corporation	T. and C. Hawksley, Civil Engineers, 3, Great George-street, S.W.	" 9
Dublin—Cast-Iron Chairs (2,500 tons)	Great Northern (Ireland) Railway Co.	T. Morrison, Secretary, Amiens-street Terminus, Dublin	" 9
Birmingham—Iron Escape Staircases at Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 9
London, W.—Steel Bridge Girders (425 tons)	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.	" 10
Derby—Cast-Iron Pipes	Midland Railway Co.	Alfred Derry, Stores Superintendent, Derby	" 10
Amsterdam—Wire, &c.	Minister for Colonies	The Technical Bureau for Colonies, Amsterdam	" 11
Winsford—Cast-Iron Pipes, &c.	Urban District Council	James Wilkinson, Surveyor, Market-place, Winsford	" 11
Birmingham—Wrought-Iron Steam Water Tubes, &c.	Elan Supply Department	The Office, 44, Broad-street, Birmingham	" 13

THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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AN IDEAL TRAFFIC SCHEME FOR LONDON.

A SCHEME for the development and unification of London traffic has been long under consideration; but now we have the promise of a definite plan placed before us by the London Traffic Commission, which resumed its sittings last Friday at the Westminster Palace Hotel, the first meeting since the return of the sub-committee's visit to the United States. The evidence given by the superintending architect of the London County Council, Mr. William Edward Riley, F.R.I.B.A., is of special interest, and we propose briefly to give the main points of scheme proposed by him, which will be based partly on the system of direct communication by irregular curves of the underground London railways and that adopted by the municipality of Paris. The latter system is described by Mr. Riley, "an ellipse formed of three irregular curves surrounding the city, but within the old Centure railway"; one of the inclosing sections is carried across the city north and south, in addition to a shorter one, and others running east and west—six distinct lines, all worked on the shuttle system, with looped ends, to facilitate the return of trains running in each section, and minimising any dislocation of traffic caused by breakdown in any section. The superintendent architect's ideal scheme for London, as given in his evidence, is "one giving circumferential lines at various distances apart, and crossing these diametrically by other lines running across the county, and joining the circumferential lines with the centre points." As pointed out, the existing and authorised electric systems (of which only the North-West London and City and Brixton tubes are not yet in course of construction) are made of a series of irregular lines which do not constitute a unified system. To bring these projected lines into unison with the present scheme they will require some alteration. Mr. Riley also suggests broad avenues converging towards the central area of the county, to increase facilities for locomotion, and these avenues would provide for underground as well as surface traffic, and it is proposed "that the underground systems of all the diametrical lines, both tube and shallow underground, might be looped at the outer ends, as in the Paris system," in order to facilitate future extensions. The want of quick communication between such centres as the Elephant and Castle and Waterloo and London Bridge Stations, both on the south side of the river and between centres on the north side, as those of Charing Cross and King's Cross, Piccadilly-circus, the Bank, &c., is a serious and growing complaint, as every one who dwells, say, on the south side knows to his cost. The tubes have relieved the situation to a small degree, but are inadequate, and we believe that the shallow subway or tramway would be the more desirable form of locomotion. Such a route from the Marble Arch to Cricklewood would no doubt be of much public service. Mr. Riley observes "that along all the main roads and railway lines which run towards the central area is conveyed at least twice a day, in and out, a large mass of the working and business population from all parts of the county, and also from districts situated well beyond the county boundary." The central area is roughly indicated by a line drawn as follows, viz.:—From King's Cross via Euston-road to Baker-street Station, Victoria Station, Vauxhall, Elephant and Castle,

Tower Bridge, Shoreditch Church, City-road, Angel, Islington, and back to King's Cross. Within this area the traffic for the most part of the day is congested at several points, and these congested points are enumerated, and include such centres as King's Cross and St. Pancras, Oxford-circus, Piccadilly-circus, Charing Cross, Waterloo Station, London Bridge, Liverpool-street, Bank, the Angel, &c.

Other congested centres are outside the central area, such as Kennington Gate, the "Plough," Clapham, Camberwell Green, New Cross Gate, &c. The railways pour vast masses of persons from the outer zones to the central area, and these crowd the streets near the terminal stations, and have to find their way by crowded thoroughfares to the various centres in the central area. By connecting the terminal stations this crowding and confusion will be greatly reduced, and passengers will be able to reach any centre within the area. The importance of connecting the railway termini cannot be overrated, and the existing services, as pointed out, could be extended so as to form one system of intercommunication. A suggested method of linking the railway termini is to extend the City and South London Railway from its "Angel" terminus, via King's Cross, St. Pancras, and Euston, to form an interchange station with Baker-street and Waterloo Railway near the top of Portland-place and having interchange stations with the Great Northern and Strand Railway, and the Charing Cross, Euston, and Hampstead railway. By this route, and the connected Baker-street and Waterloo Railway, many of the trunk line stations would be brought into communication. These are enumerated. One advantage would be to extend the Great Northern and Strand tube from the Strand, its proposed terminus, under the river to Waterloo Station, thus securing a north and south line. Another line proposed is from Piccadilly Circus to Charing Cross, the Law Courts, Ludgate Circus, and the City, which now is only traversed by crawling omnibuses, which during the day are much obstructed by street traffic. The interchange stations would be few, and is thought would not cause any serious delay.

Referring to road traffic, the evidence furnished is equally important. Where practicable, tramways should, it is suggested, approach nearer to the centres north of the river, and the dangerous termini at Westminster and Blackfriars bridges would be avoided by extending the tramways over the bridges. As a general principle, Mr. Riley thinks that passengers should be conveyed from outlying districts by lines radiating from the central area to the county boundary. Among the additional routes are specified (1) from Highbury via Hornsey, to Tottenham, (2) Clapham Common to Tooting, (3) Poplar to Eltham via Greenwich, returning via Lee, Lewisham, New Cross, Deptford, and Bermondsey, and crossing the river to the Monument; (4) from the junction of Sloane-street and Knightsbridge, down Sloane-street, along King's-road, and crossing the river to Putney; (5) an extension to Willesden Junction of the Baker-street and Waterloo Railway from the present authorised termination at Paddington, (6) Walthamstow, through Leyton, entering the City by Bethnal Green; (7) Queen-street, under the river, through Peckham, and ending at the Crystal Palace; (8) from Marble Arch to Victoria and Vauxhall in the direction of Camberwell and Peckham. It is pointed out that omnibus traffic has the advantage over railway or tramway in being able to cross the central area in any direction on the surface, though often impeding other street traffic. The locomotion extensions outside the central area suggested would convey working and business people—a duty which the present railways are quite unable to do. The City and South London line is instanced

as a good example of a direct route across the central area into the outlying parts, and the evidence points to the importance of extending the line beyond the Plough, Clapham, towards the large estates in progress, including the Council's Totterdown housing scheme. The proposed City and Brixton line might also be extended towards the county boundary, and become a most desirable link.

Alluding to the construction of new streets and broad avenues, this witness thought that the lines of such thoroughfares might be made to pass through inexpensive property, to avoid the purchase of costly interests such as would be necessary in widening existing streets. By purchasing sufficient property on both frontages, and providing for tramway lines and shallow tubes, a return from the outlay would be obtained. Several desirable routes for such avenues are given. Some of these are in the direction of radiating centres suggested. One of them is a north and south line, already mentioned, beginning at Southampton-row, near the north end of Kingsway, and passing parallel to Caledonian-road, to the east of Finsbury Park, and southward to Sydenham. Other routes include a north-east and south-east route beyond the county boundary to Leytonstone, beginning at the Tower of London, a south-west route from the western end of Victoria Embankment to Richmond beyond the county boundary crossing the Thames; a west route from Uxbridge-road westward passing Wormwood Scrubs to East Acton; a north-west route from north end of Portland-place to boundary of Paddington Recreation Ground. These avenues are only suggested, and their usefulness might be increased by their extension across the central area. The mileages of these routes within the county in both directions are stated; but we do not enter into details here. The areas in most need of additional locomotive service are said to be in the south-east district—e.g., areas in the district of Camberwell, Dulwich, Brixton, and Tooting, which will open up building land. The witness points out the difficulty of securing land within the central area at a price which will admit of the erection of working-class dwellings with financial success without charge on the rates. The less dense zones have therefore to be utilised, those beyond the county boundary; but the rapid locomotion proposed would bring these outlying districts within reach of the central areas; and it is pointed out the conditions would be so equalised that the keen competition with commercial projects when acquiring land in central districts would be less acute, and the Council would not be compelled to confine their operations to the narrow limits which are now necessary. Comparing the cost of housing at the Council's estate at Tooting and at the Bourne Estate (Reid's Brewery), it is stated that a family of six can be housed at Tooting for about five-eighths the cost of the land only at the Bourne Estate. Thus the cost of a three-room cottage at Totterdown, including land, and road and sewers, is given at £263 10s., and the actual cost of a three-room tenement at the Bourne Estate £761 12s. These are the main points in the evidence which appears to be so conclusive.

Everyone who looks at a map of Greater London and its environs must have noticed the numerous irregular lines of railway and main roads which converge from places like Rickmansworth in the north-west, Barnet or Enfield in the north, Brentwood in the north-east to the central area; on the west from Egham or Staines, on the east Dartford, and on the south from Croydon, or Sutton, or Weybridge. These converging lines and roads thicken, and produce many ramifications when they approach a radius of about five or six miles from St. Paul's, and it will be seen that they approach to, though not actually connected with the irregular oval of

the District and Metropolitan Railways. But what a confused and disjointed system! From the south side one has to travel by a circuitous road by bus or cab to reach the terminal stations on the north side or those on the Euston-road, and conversely passengers alighting at Euston or King's Cross have to proceed by long detours or by slow omnibus routes to Charing Cross or Waterloo or Ludgate. What with the "Inner Circle" and "Outer Circle" railways, and the other loops of lines made by the North Western, the Midland, and Great Eastern and Great Northern and similar systems on the South, there is a network of railways which is perfectly bewildering to the public. An ideal scheme such as that proposed would be to make the great radial lines more regular and equidistant, and connect them by circle lines at their termini, and at other convenient distances, so that every part of the Metropolis could be within easy reach. Mr. Riley's scheme practically does this for London; it distributes equally, so to speak, the central termini, and those on the outskirts of the Metropolis as far as possible, and at once relieves the traffic of the few large termini which now do duty. We may look at the problem in another way. There is the large central congested area of population of the City and Westminster, the area wherein all the work and industrial centres of the world are concentrated, radiating from which are main streets and lines of railway. These form the great arteries, through which at intervals of the day every twelve hours a vast ebb and flow of human traffic, vehicular and pedestrian, takes place. In the early morning hours hundreds of thousands of people pour themselves into the congested centre, and during the evening the same crowds make their way outward. Every thoughtful observer of the rapid growth of the Metropolis must see that with the increase of the population the central area must become more and more congested, and that the pressure of the traffic from an ever-extending outer boundary must soon cause the channels of communication or arteries to become too narrow to discharge their living stream. A road or street constructed a few years ago is quite inadequate now to discharge the large amount of traffic, and this applies, of course, in a greater degree to the streets which enter the City from the various outlying districts. They are becoming too narrow for their original purpose. The plan suggested by Mr. Riley for linking the railway termini by which a passenger, say, from Waterloo to Euston would be able to make his journey without changing or by only one change; the suggestion of forming broad avenues passing through populated areas as, for instance, the north and south route from, say, Southampton-row northward to Finsbury Park and southward to Sydenham within the county, and other routes proposed are ones that deserves attention before the acquisition of property becomes a serious item of cost. These avenues, no doubt, should pass through the central area. The scheme proposed by the superintending architect is a noble one worthy of the municipality of a great and wealthy city.

THE PRACTICAL IN BUILDING.

AN inclination to shirk the practical in building as well as other pursuits is one of the tendencies of the age, and this has been mainly owing to the academical training of professional men, and to other causes such as competition, hurry in business, and the desire to make a reputation—all of which things have been quite opposed to a thoughtful study of the real requirements and functions of building. Building schemes are now taken up from purely commercial and business motives; it is a question of being first in the

field, of competing with large firms, or of obtaining public support, and of showing a good investment. There is the hurry and rush of preparing designs, in which the architect only takes cognisance of the general requirements, and has no time to enter into practical considerations such as accommodation, construction, cost, and the like, or to weigh such matters as the best and most workable plan, the best arrangements for plant, for heating or ventilation, or the most practical system of fire-resisting construction, &c. The architect has no time to study these details. The plans and scheme must be prepared quickly and advertised. Even the contract must be hurried. The architect likes to see even his name associated with the scheme. The company or promoters are eager to obtain all the support they can. Such haste is inimical to careful thought and practical considerations. To consider first the planning of buildings. How few architects in the present day look at the subject as a really scientific study, in which definite facts and data are closely related, or as a part of the design requiring personal knowledge of the habits and wants of the kind of tenants, or of the class of occupants who use the building, in which every person has an interest, of those who do business in the building, or who live in it? The ordinary professional man takes a few plans of the sort of building he wants, and proceeds to sketch out an arrangement till he thinks it will answer. Or the problem is solved in his mind if he hits upon a plan which will give the rooms and the dimensions required by the instructions. But how these rooms are to be located or grouped, with the object of saving the time of those who use them; whether an official will find it more convenient to have his office within easy communication with his clerks, or if there should be a door between one room and another; which offices are most frequented by the public in a municipal building; or how a number of students will stand or sit round a laboratory bench; the most convenient mode of arranging the kitchen offices in connection with a particular building; how a few feet of corridor can be saved, to diminish the servants' labour, are little matters which never enter into the head of the designer of a certain class. And yet these are just the points and questions upon which the working aptitude of the plan depends. They make all the difference between a practical and an impractical plan. Competition plans are often destitute of this special study, and we go through many designs for municipal offices, libraries, technical institutes, which show an utter indifference to the simplest duties of town clerks and surveyors, rate collectors, sanitary inspectors, or medical officers and students, or those who superintend libraries, or go to borrow books. Again, in public halls and places of assembly the movement of crowds entering or leaving ought to be made a study, so that all confusion and jostling may be minimised as much as possible. In dwelling-houses the problem should be to place every room in its right place for use and aspect, to reduce all passages, to avoid steps, and to facilitate by every possible and direct means the conveyance of goods and provisions, and so to economise service and the labour of servants. The kitchen should be convenient to the dining-room, the sanitary arrangements be confined to one part of the house, and the service and waste pipes placed so as to be accessible for repair. These are points constantly neglected in the desire to conform to some type of plan. Even in such details as the size and position of tables and sideboards and other furniture we find little attention paid to the seating of guests and the room necessary in serving them. These points of plan become more urgent in the design of labourers' dwellings and cottages, where every inch of space is of value. The

positions of larders, closets, seats, and bedsteads ought in every case to determine the size and shape of the rooms. The economics of plan, indeed, open a large question in the design of every class of building.

* Practical considerations enter no less into questions of materials and construction. The wrong material may involve, and often does entail, unnecessary expense in repair and painting, &c. We often see provided the wrong sort of wood for inside joinery, and panelling which shrinks and is full of "dead knots," and which requires continual painting; or we see the wrong sort of wood put into panels for staining and varnishing, which ought to have a good "figure." Thus, in selecting hardwood for joinery, the panels should be selected from the ornamental portion of the plank, whereas the framing may be straight-grained. The plank should be cut specially for this purpose. For varnished work, the pieces for framing and panelling ought to be selected for these particular positions, instead of which we find little attention given to the subject by the architect; different shades of wood, heartwood and sapwood, are placed together in the same panel, which renders the joint between the pieces visible, or half the panel is "figured," the other half plain. As a matter of fact, it makes all the difference the way the wood is cut; if cut radially the figure is exposed, whereas tangentially the grain is straight. How many mistakes are made in the selection of fir. "Deal" is described, whereas the term does not refer at all to kind of wood or quality, but to size only. The many varieties of fir and of oak are confusing; the architect is more successful if he can distinguish the principal kinds, and insists upon obtaining them; but he must do this before they are "primed," which is done before they are sent on the building. In such trades as stonework and brickwork, the architect is obliged to accept a great deal of very questionable material if he does not personally know the difference between, say, a limestone and a sandstone or a bath stone of one kind from that of another bed. Then if he is told that the stone has been laid upon its "quarry bed," he ought to be able to determine whether it is so or not. The omission or want of knowledge in either case may very seriously impair the durability of the stonework, and may render future repairs costly. The practical supervisor will exercise a great deal of his time in looking at the material, whether timber or stone, before it comes to the building; he will be better able to determine whether the timber or deals are of the specified quality before their defects are covered up by paint, and to see if the wood is free from sap, whether the joints are of the right kind, and the grooving and rebating is done; also to see if the beds of stone are worked level, and the block is of the right dimensions specified. These are matters which can only be properly examined at the workshop. When once the material is put in the building or fixed there is little chance of detection. Bricks, too, should be examined before they are put in the building, and any of inferior quality be ordered to be removed, as they can be tested only by examination before being built into a wall. The practical man will make it a special study to know the various kinds and qualities of bricks on the market. He will also see that they are soaked in dry weather before being used, and are properly bonded at angles, reveals, in piers, bay windows, flues, &c., matters which are very seldom examined by the architect, who looks only at the finished work and the external appearance. Small details will receive his attention, such as the bonding of a pier, the working of a gauged arch, the number of joints to a foot in height, the make and squareness and arris of the bricks. He will see that the openings of doors and windows are of such a size that the bricks

will not have to be cut. The practical mind in building generally exhibits itself in dimensions which can be worked to with the least cutting or labour, in arrangements of material that can be made with the marketable sizes of such things as timber and brick; whereas the impractical architect puts the workman to unnecessary labour in specifying sizes which cannot be worked to without waste of material. Working drawings are often made which show thoughtlessness or disregard of these things. We see stone or terracotta blocks to dimensions which cannot be economically made to agree with the courses of brick, timbers cut to scantlings that entail great waste, whereas a knowledge of the conversion of timber by sawing would dictate a size for, say, joists that could be made out of a plank or a batten. To use the multiple of a brick for openings or some even dimension instead of cutting is appreciated by the practical bricklayer and joiner, and all engaged in building, as it avoids unnecessary labour. Hence the value of standard sizes for bricks, timber scantlings, iron and steel sections, and other materials. Draughtsmen and young architects appear to ignore these considerations of even dimensions, and add to the labour and cost without the slightest compensating advantage. A fraction of an inch in the depth or thickness of a joist, or the size of a modillion in a cornice, if insisted on, would put the builder to much extra cost in material and labour; but he does not as a rule trouble about these irregularities, but uses his own discretion, and the architect is often none the worse off for the slight alteration. So in making detail drawings of woodwork: dimensions and thicknesses are often shown which cannot be got out of the ordinary deals and battens. To a practical man such detail drawings are regarded with a kind of sneer; if carried out as the architect intends the cost is seriously increased. They have therefore to be altered, and the builder takes upon himself the task. But the architect's design may be shorn of its solidity and beauty by such alteration, and in this way many designs are robbed of the effect the designer intended. The architect wonders how it is when the work is done, whether it is a stone or brick, or a wooden cornice or window, or other internal joinery, the effect is meagre or thin; but he does not realise the actual working conditions, and that the builder has only tried to produce the same effect by adopting the trade rules without incurring extra expense. He had, of course, no excuse for making the alteration without consulting the architect; but the wary builder is too artful, and proceeds to carry out the detail to the best of his ability. If he had consulted the architect and pointed out that the material used would be an extra, the latter might have insisted on its performance; on the other hand, he might have shown another and better way of using the material. Thus the practical architect ought to understand the modes of conversion of material, and the marketable sizes which obtain. The value of standardisation of rolled steel sections is a case in point. The practical designer of iron and steel structures knows how useless it would be to show any sections that could not be obtained unless special rolls were made.

In the choice or specification of materials, too, there is often a thoughtless disregard of the circumstances; the local material, whether brick or some stone obtainable in the neighbourhood, is not thought of, but a material used that has to be brought from a considerable distance, to which the cost of carriage has to be added. Also in the working and treatment of stone and other materials, we often find a great deal of undesirable labour thrown away without any effect. In the use of granite in some positions, as in plinths or basements, it would be absurd to dress the surface to any

smoothness; the pick is sufficient to dress off inequalities, and to give a massive appearance. In finer-grained stones the tooling used should be adapted to the situation and character of the work. Often we see a smoother texture given than is necessary: the practical architect is one who will pay regard to the requirements of each case, and will specify the kind of tooling to be used. To dress a hard, coarse stone down to a smooth face would be wasteful labour; the effect would be better done by a claw tool, the teeth being cut to suit the texture.

The old Mediaeval masons knew well what kind of dressing to give to stonework, and many of the harder lime and sandstones used, which have not decayed by the weather, show clearly traces of the coarse tooling or chisels used. In timber and woodwork the adaptation of labour to the class of work and its position in the building is equally important. Sometimes a sawn or roughly-chiselled face may be used with better effect than a planed surface. Uniformity of texture or smoothness is not certainly an artistic quality in many instances: it implies mechanical labour and machine-turned surfaces only adapted for machines, the very reverse of all that is expressive or individual. Thus a piece of hammered ironwork is more artistic and pleasing than a piece that has been cast or turned out of the rolling mills. There is strength and meaning in handicraft of every kind. The modern craze for machine labour and smoothness has hindered art of the more vigorous kind; it has destroyed all individuality and character. The practical mind at least knows how far such qualities as uniformity and smoothness of manufacture are desirable. He knows that it is unnecessary in building to use "picked stocks" for ordinary brickwork, or to specify rubbers "gauged, rubbed, and set in putty" in a part that is out of sight or reach; for a similar reason he can value texture in brickwork and stonework, the hand work of chisel, or pick, or gouge in woodwork, and the hammer in wrought iron. He knows, in a word, how far to carry that desire for perfection and minute detail without prejudice to the work as a whole. He has a sense of proportion which we fail to observe in those who look at architecture as a field for the exercise of all kinds of experiments, eccentricities, and extravagant detail.

Two practical considerations deserve notice in this connection. The tendency to elaboration of design is shown in many designs, competition and otherwise. Instead of trying to discover a simple solution of the problem, the architect is apt to introduce or substitute a formula of a more complex kind, derived from outside examples. The consequence is to obscure the real conditions, to adapt another design for a different purpose, and to complicate the plan and treatment. Simplicity is lost in the attempt. If it is a design for a town-hall or offices, the architect tries to engraft what appears suitable into his work. He does so at the cost of simplicity and convenience; the plan becomes confused and too elaborate. If it is a design for a suburban church, the author cannot divest his mind of a type of building suitable only for a town. A simple treatment is out of the question, and the design loses character. A great deal of this forced kind of design is prevalent. Then there is the question of cost, which generally exceeds the funds at the disposal of the committee. They are both points of a practical kind, which appeal to all building owners and committees who have obligations to perform, but which many in the profession are slow to profit by.

The annual report of the sewage committee of the Bradford Corporation states that at Frizinghall an experimental apparatus for the distillation of grease direct from the sludge cake is now on trial, and the sale of the grease has created a new source of revenue for the committee.

THE ARCHITECTURAL ASSOCIATION.

THE third ordinary meeting for the present session of the Architectural Association was held on Friday evening at 9, Conduit-street, W., the President, Mr. H. T. Hare, in the chair. The following fresh donations to the New Premises Fund were announced by the President: Messrs. T. E. Collett, £25; R. Hesle Tiltman, £25; the Proprietors of the BUILDING NEWS, £10 10s.; Leonard J. Williams, £10 10s.; Keith D. Young, £10; H. A. Cresswell, £5 5s.; F. M. Elgood, £5 5s.; G. W. Lane, £5 5s.; A. C. Martin, £5 5s.; J. W. Penfold, £5 5s.; J. A. Keeve, £5 5s.; Hugh Stannus, £5 5s.; Cecil C. Brewer, £5; Henry Tanner, sen., I.S.O., £5; G. H. Hamp, £3 3s.; E. Wallfrey, £2 2s.; F. K. Betenson, £2 2s.; Walter Cave, £2 2s.; T. P. Clarkson, £2 2s.; R. L. Hesketh, £2 2s.; J. C. T. Murray, £2 2s.; H. Whiteman Rising, £2 2s.; C. H. Brodie, £1 1s.; and Henry Tanner, jun., £1 1s. The President added that, in addition to this list, a number of members had, in accordance with the Committee's suggestion, doubled their subscriptions for the current session. Mr. Francis G. F. Hooper, hon. treasurer, formally moved the adoption of the committee's report and balance sheet for the past session. This was seconded by Mr. Needham Wilson, and was agreed to. The following were elected as members:—Messrs. Herbert Dennis, C. W. Reeves, E. J. Kelly, S. Greig, H. A. Bower, A. J. L. Leman, E. E. Beaumont, A. C. Caudwell, F. W. Commin, D. G. Round, F. G. W. Dudley, H. G. Burgess, E. D. Brown, F. R. Foster, and H. Merley. The President announced the following reinstatements:—Mr. John P. Seddon, one of the original members elected in 1847, and hon. secretary in 1850-51; also Messrs. H. P. Burke Downing, W. B. Huxley, Arthur C. Lee, and Harold A. Woodington.

MODERN CHURCHES.

A very full paper on this subject, illustrated by a large number of plans, sections, working drawings, and perspectives by the leading architects of the present day and their immediate predecessors, was contributed by Mr. CHAS. A. NICHOLSON, who wrote regretting his inability to be present owing to the dangerous illness of his father (Sr Charles Nicholson, Bart., since deceased). In the author's absence, the paper was read by Mr. F. C. EDEN. Modern church building, Mr. Nicholson remarked, might be said to have been evolved during the century just ended. Owing to a variety of causes, church building was at a standstill in England between the death of Queen Anne and the end of the 18th century. The influence of the Hanoverian Court was not as to foster an enthusiastic churchmanship. The population was almost stationary, the old churches sufficed for all requirements; if they fell into disrepair, they were patched up; if they were considered draughty and cold, ceilings were made, and partitions, pews, and galleries were built; if they fell or were burnt down, they were either left in ruins or else rebuilt in the plainest possible fashion. In London, and some other large towns, a few new churches were built; generally these were proprietary chapels, financed by the ground landlords and supported by means of pew-rents. St. Peter's Church in Vere-street, and Berkeley Chapel, Mayfair, may be taken as typical of the ecclesiastical ideas of the middle of the 18th century—plain, substantial, brick buildings, with round-headed windows and ugly belfries; their interiors reminiscent of St. James', Piccadilly, or St. Martin's-in-the-Fields.

ELIZABETHAN AND JACOBAN CHURCHES.

The few churches that were built or enlarged between the Reformation and the Great Rebellion were generally of Debased Gothic character, such as is met with in many Oxford colleges. Even Inigo Jones, who introduced Italian models after his travels on the Continent, built the church of St. Katherine Cree and the chapel at Lincoln's Inn somewhat after the old Gothic manner. After the Restoration, the fashionable style became that of the school of Wren. Side by side with this, however, there lingered on the remains of the old Gothic tradition, which never entirely died out in the remoter country districts. The nave and tower of the church at Warwick, built in Queen Anne's reign by one Sir William Wilson, and the churches at Dartmouth and Falmouth, the spires at Ilgham Ferrars and at Stratford-on-Avon are familiar examples of Gothic work executed during the 17th and 18th centuries. The lecturer proceeded to describe the revived Greek

churches of the days of Chambers and the Brothers Adam, and the "Gothicisms" of Essex and Wyatt, and then dwelt at some length on the

LITERAL CLASSIC REVIVAL

of George the Fourth's reign. Soane, Decimus Burton, and Wilkins were leaders in this movement, while the Wyatts and Nash frequently worked in the same style, which was adopted in most of the numerous London churches that were built in the years immediately following the battle of Waterloo. In 1818 Parliament unanimously voted a million of money for church building in London and other growing cities. A favourite ecclesiastical architect of the day was a certain F. Bedford, who designed many churches in the south of London, of which St. John's, Waterloo-road, may be taken as a typical example; a large, plain, square room fitted up with pews and galleries, with a portico at one end, and a halfry on the ridge. Three churches were built at the expense of the ratepayers in St. Pancras by Henry Inwood. The new parish church was designed in 1819 after the model of the Erechtheum, the steeple being adapted from the Tower of the Winds. The most remarkable Classical church of this period was Cockerell's Hanover Chapel in Regent-street. The recent destruction of this charming building seems most deplorable, although the new church in Davies-street, which was to replace it, is one of our best and most interesting modern buildings. Marylebone Church, completed in the year 1818, from designs by Thomas Hardwick, at a cost of £60,000, has a pretty steeple bestriding the ridge of a rather fine portico. The combination of these two features is incongruous; but the effect of the building is good, owing to the weathering of the Portland stone of which it is built. Soane's churches at Walworth and Marylebone, St. Peter's, Eaton-square, by Hakewill, and a church in Bermondsey by Savage, are all of Revived Greek character, and better than the general run of the work done at the time. Churches more or less Gothic in character were built in London and elsewhere. Amongst the Commissioners' Churches, two—by Sir Charles Barry and James Savage, at Islington—were singled out for special praise by "E. I. C." in the *Gentleman's Magazine*. These are large brick buildings of Perpendicular character, pewed and galleried like the Classic churches of the period, built with embattled parapets and square towers or octagonal belfries. Similar churches were built at Edinburgh and in several provincial towns, such as Liverpool and Brighton, and places in the Potteries district. The best of this class of churches was that of St. Luke, at Chelsea, by James Savage, a building of considerable size, with a pinnacled west tower.

THE TRACTARIAN MOVEMENT,

the writings of Pugin, and the rebuilding of the Palace of Westminster, combined in the encouragement of the Gothic Revival in the second quarter of the 19th century. Gothic architecture ceased to be looked upon with suspicion, or regarded as a badge of Popery. The preaching places which had hitherto sufficed for them, ceased to satisfy the requirements of the majority of Churchmen. The modern type of church arrangement was thus gradually evolved during the reign of Queen Victoria, and, with very few exceptions, existing buildings were altered in such a way as to make them conform to the prevailing fashion. After the year 1837, numbers of new churches were built in country places, and many of the old village churches were restored. A prominent early Victorian architect was

EDWARD BLORE,

who restored Lambeth Palace and refitted the choir of Westminster and Peterborough. There exist several churches from his hand, some of them in a starved Early English style, others imitated from the Romanesque churches of the Rhine provinces. These buildings are, as a rule, built of white brick, with cement or Bath stone dressings, and they are characterised by a singular combination of pretentiousness and meanness. After a few attempts to reproduce Norman work, or basilican arrangements, the fashionable church architects of the middle of the last century settled down to a style imitated from English Decorated work, using Early English, which was supposed to bear being starved, for cheap jobs. Considerable improvements were at this period introduced in the liturgical arrangements of churches—galleries and pews were generally abolished, chancels were formed, and more space was provided about the altars.

CHEAP AND HASTILY BUILT CHURCHES.

Like most good people who are very much in earnest, the Gothic revivalists often went too far. They built too hastily and too cheaply; they restored too energetically. Some of their work is already ruinous after only half a century's wear and tear; yet it is hardly fair to blame the individual architects for this, since they were obliged to supply a growing demand at a very low cost, and, if one man declined a commission, a rival would always be found ready to step into his shoes. The cheapness of churches built in the fifties may be partly accounted for by the growth of the railways, and partly by the fact that church designs were then generally based upon rural and parochial models. The choice of this type minimised constructive difficulties, and made it possible to cover a considerable space in a very economical fashion. As a result, the churches of this age are seldom of a really imposing or of a dignified character. The lecturer devoted some attention to the better work carried out by Pugin, and continued: Meanwhile,

THE ECCLESIOLOGICAL SOCIETY

was steadily influencing the architects of the day. Beginning by insisting upon a literal reproduction of old forms as a necessary preparatory process, the ideal of these enthusiasts was to bring about the development of a new and living vernacular architecture based upon Gothic models. Scott, and Brandon (the architect of the Irviogite Church in St. Pancras) were to a certain degree in sympathy with the views of this society, but less so than Carpenter, Butterfield, and Street. Carpenter's opportunities were few, but his fine church in Munster-square is sufficient evidence of his ability, and an unexecuted design of his for a cathedral at Colombo is quite remarkable as an original attempt to adapt Gothic to a hot climate. Slater (who had been partner with Carpenter), Ferrey, Withers, Dawkes, Buckler, Brandon, Teulon, and Christian were all popular church architects in the fifties and sixties. But the work of Butterfield and Street was far ahead of that of their contemporaries, and its superiority quite justifies the patronage they received from the Ecclesiological Society. All Saints, Margaret-street, Butterfield's first great work, was designed so long ago as 1849, and is a marvellous production for its date. The fine outlines of this church, and the completeness and thoughtfulness of its details, stamp its designer as an artist of real genius. Whatever may be thought of some of the details of Butterfield's work, there can be nothing but admiration felt for his strict insistence upon principles, and for the thoroughness with which he worked. His architectural detail was invariably based upon purely English models. He made a frank use of modern materials and modern constructive expedients, and always insisted upon the inclusion of every detail of ornament and furniture as part and parcel of the architect's scheme, determined by him at the very outset of an undertaking. Butterfield's restoration work is less commendable than his original designs. Butterfield had few followers, but the work of George Edmund Street had a very strong influence upon his contemporaries. Like Butterfield, Street remained faithful to Gothic motives, though in the middle of his career he was very much influenced by the beauties of French and Italian models. His constructive ability was hardly equal to that of Butterfield, but, like him, he insisted upon sound building and upon adherence to a standard of liturgical arrangement in all his works.

MIDDLE NINETEENTH CENTURY WORK.

Sir Gilbert Scott, in his career of forty years' duration, did as much as any architect to influence the taste of the nation. Working at first in correct English Decorated style, his later buildings are often somewhat French in character, though he never went to the same length as Street or Barges in these matters. Posterity will perhaps judge him upon the merits of the numerous restorations which he carried out. This is hardly fair to his memory—he may have made mistakes sometimes; but we may well be thankful that he was at any rate more conservative and modest than most of the architects of his time. Barges did not carry out very much important church work besides Cork Cathedral and the excellent restorations at Waltham Abbey. His church of St. Faith, at Stoke Newington, is, however, interesting as being arranged upon distinctly modern lines. The churches build by James Brooks in North London

are designed in an early and severe manner, solidly built, and of fine proportion. Brooks's churches are roomy and well arranged for modern requirements, and their architect frequently introduced vaulting over the whole or a part of the buildings carried out by him. The late John L. Pearson's large town churches are a class by themselves. His churches are all vaulted throughout, and designed with great constructive skill, the area of the supports being reduced to the least possible limits. Their plans are often ingeniously arranged to fit an irregular site, their detail is severe and of strictly English origin; but they vary considerably in general design. Perhaps the individual features of these churches may be considered unduly small in scale, and their effect is rather toy-like in consequence of this, yet the various parts are always in agreeable proportion with one another, and are refined in themselves. A contemporary of these was the late Sir Arthur Blomfield, some of whose earlier churches deserve attention on account of their frank modernity, iron columns and galleries being freely introduced.

LATE NINETEENTH-CENTURY WORK.

Little important church work was done at the end of the nineteenth century, and most of it was entrusted either to the architects just mentioned or to living artists of unquestioned ability. The younger Gilbert Scott and John Sedding, though their opportunities were few, certainly founded a school of imitators, if not of followers. The former, with Messrs. Bodley and Garner, and others, evolved a refined modification of Late Gothic work which is seen at its best in large town churches. Sedding, with an intimate knowledge of old work, was, nevertheless, frankly modern in his ideals. Each of his buildings marks a fresh phase of his versatile powers. The earliest and most complete of his churches, that at Bournemouth, has a nave and a chancel with very slender arches opening into a north aisle, a stone rood screen and reredos, and a western tower, the detail being Late Decorated, and all the accessories of the church very complete. Cardiff, Hayle, Falmouth, and Highgate are great, simple, hall-like churches, with narrow aisles and no chancel arches, their detail based upon early models. At Truro Sedding followed the old Cornish type. At Clerkenwell the work is Renaissance, steel stanchions and girders being inclosed in concrete columns and entablatures. Holy Trinity, Chelsea, is a wide, hall-like church, with widely-spaced and massive piers, and it was intended to give eminent painters and sculptors a free hand in its internal decoration under the general guidance of the architect. The last church which Sedding designed was built after his death at Ealing by his successor, Mr. H. Wilson. Here the supports are unusually far apart, and the piers carry wide and low segmental arches. There is no clerestory, but galleries are formed over the flat ceilings of the aisles, with three triforium arches in each bay of the nave. The nave is lighted by a huge west window with traceried buttresses, suggested, perhaps, by those at Gloucester. Sedding, like Pugin, was a most versatile designer. His woodwork is unrivalled in fancy and refinement; his embroidery, glasswork, and metalwork are full of interest, and always designed in strict accordance with the nature of the material used. To some extent J. F. Bentley's work resembled that of Sedding, though it was founded more strictly upon precedent. In his last and most important church, he was compelled to follow archaic and foreign models, and he attained a result which bids fair to be honoured with the sincerest form of flattery.

DURING RECENT YEARS

many good, bad, and indifferent churches have been built; many styles have been imitated, and many mannerisms developed only to be forgotten. One is therefore led to the conclusion that architectural style is no longer a question of mouldings and traceries in these days of cosmopolitanism and railways. A building may be unmistakably modern, whatever may be the shape of its windows or its pillars, the disposition of its parts, or the materials of which it is constructed. Unintelligent plagiarism of eccentricities should be deprecated. Thus a fashion has lately arisen for bisecting traceried windows with clumsy mullions running up to the arch apex, a device calculated to cause the stonework to be fractured in the event of any settlement. Another latter-day freak is the boldly buttressed tower, abruptly cut off at the top without any cornice or other archi-

tectural finish, and sometimes capped with a temporary-looking shed-like roof, or with a stunted dome. As regards ornament, it goes without saying that it should not be used unless it is the best of its kind. This means that good diaper work is better than bad figure-work; white-wash is better than commonplace decoration, and plain windows to be preferred to tinted cathedral glazing, and, indeed, to most stained glass. Brick and stone are better than tawdry polished granite, and good woven work than ordinary church embroideries. Architecturally, the great invention of recent years is

THE CHEAP CHURCH.

The cheap church of fifty years ago was ornate, but shoddily built. Twenty years ago economy was effected by building substantial and fairly complex churches of the cheapest and ugliest materials, red and yellow brick, fitting them up with varnished deal furniture, and stunting their general proportions. Where funds are limited it seems better to adopt an economical plan from the outset, discarding chancel arches and complexities of roofing, and spending the available funds upon sound building and some degree of finish in the details. Sedding's churches at Falmouth and Ealing are capital examples of economical planning. Though solidly built, and of good scale and proportion and interesting detail, the cost of these churches worked out at about 6d. a foot, or £9 or less, per sitting. Economy may be effected by avoiding undue multiplication of parts, and by disposing the section of the church in such fashion as to secure an agreeable proportion in each of its alleys without undue expenditure of material. The unit by which the eye measures the size of a church is the width of the nave bays. If these are unduly wide, and the scale is not restored by some device such as a subdivision of the bays, the church looks shorter than it really is. We must all have noticed how the adoption of sexpartite vaulting shortens an interior. On the other hand, if the features are too small, the church will look toy-like. The best dimensions seem to vary between 15ft. and 25ft., according to the size of the church. An agreeable proportion between height and width can generally be secured, whatever the size of the church, by the adjustment of the relative widths of nave and aisles. Thus, if a church be 60ft. across, and its nave 30ft. wide, the wall-plates must be, say, 40ft. from the floor, in order to secure agreeable proportions. If, however, the nave be reduced to 21ft. in width and the aisles proportionately increased, the wall-plates need only be 28ft. from the floor in order to obtain the same proportion as before. Unless ample funds are available, it seems a mistake to attempt a clerestory, because a one-story building looks much higher in proportion than one in which the height is subdivided into pier arch and clerestory. It is generally possible to obtain a sufficiently tall arcade to give dignity to the interior of a one-storied church, and if the aisle roofs are flat or span ones like the old West Country churches, a dignified range of windows can be contrived in the aisle walls. Where clerestories are attempted in small churches, it is desirable that there should be a considerable difference in scale between aisle and clerestory. Thus the clerestory may be subordinated to the aisle, as was commonly done in 15th-century parish churches, or on the other hand, the clerestory may dominate the design, like that at Malvern Abbey. The cheapest known form of church is that in which a single large slanting roof covers both the nave and the aisles. If this plan must be adopted for the sake of economy, it is still possible to secure good scale in the central alley by using bold arcades and large windows. In these cases the aisles must, of course, be sacrificed, and their windows must be small, perhaps square headed. Good hints for the treatment of such edifices may be gathered from the village churches in the timber districts of England, and from some French work. The detail of such buildings should, of course, be simple; and the extent to which simplicity may be carried without sacrifice of dignity may best be learned from a study of old work. A small and cheap, but most successful, village church was built some years ago by Mr. Harrison Townsend in a Surrey hamlet. There is a boldness and distinction about this little church which it is quite unusual to find in the generality of modern work, and its cost worked out at not more than £3 or £4 a sitting.

CROWDING AND CRAMPING TO BE AVOIDED.

Although, as has been indicated, it is possible, and often legitimate, to exercise parsimony in

adjusting the proportion of the cross-section of a church, it must not be forgotten that actual height is a thing in itself most desirable. Although lack of height can be neutralised by skilful disposition of the resources at the architect's disposal, it is a very false economy to attempt to save money by crowding the floor space of a church. The planning of altar, font, seats, and so forth are determined by the average sizes of the human body. A sanctuary should be roomy, not less than one, or, in large churches, two bays in length. Unless there is ample space, steps should not be multiplied, narrow and crowded steps being both dangerous and undignified, especially at the altar. The wider that pews can be spaced the better. If the site is cramped, it is better to introduce galleries than to crowd the floor space. Pews seem preferable to fixed rows of chairs, which are ugly and rickety, but there seems no good reason why a part of the church should not be pewed, and the rest of the floor left open and used only for movable chairs, as is often the case abroad. Roomy vestibules, screened off from the body of a church and fitted with swing doors, greatly add to its convenience and comfort, and may be advantageously introduced, even though they may necessitate the building of western galleries. Vestries and accessory buildings are too generally cramped in modern churches. As regards the position for

THE CHOIR AND THE ORGAN,

it is important that these should not be placed too far apart, nor be at a long distance from the altar in an English church, because large portions of the Prayer-book services take the form of verse and response between priest and people. The Continental plan of treating the musical part of the service as independent of the ritual—for instance, the performance of organ solos or anthems during the canon of the mass—does not seem likely to commend itself to English ideas. Except, therefore, in a very short church, there are objections to placing the organ and choir in a west gallery; though, if there can be two organs, the larger instrument should certainly be placed at the end of the nave, or of one of the transepts, where sufficient height is available to allow the larger pipes to speak properly. The common custom of placing the choir in the chancel generally works fairly well, and it seems a pity to abandon it for the mere sake of novelty. But in some very large and long churches, and in cases where there is a low and narrow chancel arch, the singers are best placed in the nave or in galleries facing each other like those at Milan, at St. Anastasia, Verona, and at Exeter Cathedral. These minstrel galleries may be used with a west-end organ. The best arrangement must, however, be determined by so many circumstances, that it is not possible to lay down a general rule for the placing of the organ and choir. The Italian plan of putting them behind the altar would not commend itself to English ideas.

CHAPELS

are convenient, indeed, almost necessary adjuncts to parish churches of any size. A chapel should be conveniently placed with regard to the entrance-doors of the church, or it should have an entrance of its own, and its heating and lighting arrangements should, if possible, be self-contained. Only two steps are necessary at a side altar, the footpace and the communion-step, as side altars are only used for plain celebrations.

THE TOWER.

The traditional position of an English church tower is upon the main axis of the church, either at the west end or upon the crossing. But there may often be circumstances that suggest some other position as best for the tower, such as the side of the nave or the chancel; and in such cases it is often possible to obtain fine internal effects by a judicious contrast of the massive supports of the tower with the lighter piers and arches of the rest of the church, as is done in the 15th-century church of St. Mary Steps at Exeter. The internal treatment of the tower is one of the great chances open to the church architect, and this feature has been handled in a remarkably masterly way by Butterfield at St. Albans, Holborn, at Stoke Newington, and at Rugby.

CATHEDRAL DESIGN.

Should it fall to our lot to design cathedrals or large collegiate churches, we should, unless we have very good reasons to the contrary, place the

towers and dispose the main lines of the building in a regular and monumental fashion, and it is very doubtful whether a happier grouping can be desired from the traditional English combination of a large central lantern with smaller belfries at the west end. The requisites of a modern cathedral are a nave sufficiently spacious for a large congregation, and a choir roomy enough for the cathedral staff and the senior clergy of the diocese. A new cathedral should not follow old monastic models in too literal a fashion. The ideals of the French cathedral builders of the 13th century, as exemplified at Paris and Bourges, have more in common with modern requirements than the monastic churches of our own forefathers. The plans of the French cathedrals are unbroken rectangles, with apses and double aisles and galleries all round, the choir and altar being in the middle, and in full view of the laity, who were admitted to the nave, the aisles, the ambulatories, and the galleries. This appears to be an ideal arrangement for a great national church, and possesses advantages that are lacking in the later French cathedrals, with their innumerable private chapels, and in our own minsters with their long, narrow plans and closely-screened choirs. The cathedral builders of the future should surely make the fullest use of modern constructive facilities and engineering skill in order to inclose great unbroken floor spaces with structures that shall be stable, fireproof, durable, and rust-proof.

Mr. E. PRIELEY WARREN proposed a vote of thanks to the lecturer for his scholarly and suggestive paper. Church architects needed to exercise their common sense, and a chancel arch, as Mr. Nicholson had suggested, was often a useless expense, and also reduced the apparent length of a small church. If brick was necessarily employed for a church, it was best to keep to the one material throughout, and not to introduce Bath stone for dressings, as such a practice produced a patchy effect. He had no objection to plaster, where cheapness was an object, if it were introduced frankly. The great aim should be to construct truthfully, and hence buttresses should not be introduced except where they were needed to resist thrusts. As compared with foreign churches, our old English churches were small and pitiful—doubtless owing to the comparative poverty of the country during Medieval days. A common fault was to build a church so as just to fit the estimated congregation, and thus the building was deprived of the qualities of spaciousness and dignity. It should be remembered that in building a church for more than 300 people it became increasingly easy to build economically as one enlarged the accommodation, for the voids rapidly grew. The affectation and obvious striving for originality of some modern church architects was very displeasing.

Mr. A. NEEDHAM WILSON seconded the motion, and expressed his regret that in modern churches the air of reverence, awe, and mystery was generally absent. He would do away with the east window—it overlighted the church and destroyed all sense of mystery. Why should not cloak-rooms for wet garments and umbrellas be provided in churches, as in theatres and concert halls?

Mr. G. H. FELLOWES PRYNNE referred with approval to the individualism apparent in all the churches of Butterfield, Pearson, and Sedding, and expressed his regret that the author had not touched on the important and practical topics of heating and ventilation.

In putting the vote of thanks, the President emphasised the danger of overheating a sanctuary, remarking that almost every church was too light. Style did not matter much; what the church architect needed was a devout and poetic feeling.

THE SURVEYORS' INSTITUTION.

THE opening meeting of the session of this society was held on Monday evening last at 12, Great George-street, S.W. In the unavoidable absence of the president (Mr. A. Buck), who was detained by an illness, from which, we understand, he is recovering, the chair was taken by Mr. H. T. Steward, Vice-President, and Mr. Buck's opening address as President was read by the secretary. The address was, as it professed to be, soundly practical, many sides of the surveyor's varied vocation being dealt with. Many of the great changes which had marked the last century were accomplished by the aid of the surveyor, and the vast engineering operations

and dealings with land which called for his co-operation were responsible for bringing forward from many a countryside the men who became the skilled advisers, the trusted arbitrators, and the agents into whose hands were committed interests representing hundreds of millions of money. By their agency land had been largely freed from the shackles and disabilities which formerly limited its satisfactory usufruct, either by tenants or owners. A great gain had been effected by the abandonment of the custom of renewing leases for lives and for years, the loss, to the Church especially, from the former system being almost incalculable. The surveyor had borne a considerable part during the last 50 years in the great public improvements which had transformed the face of our towns and cities, the provision of a good water supply, the sewerage of towns, the improvement and widening of roads and streets, the demolition of insanitary dwellings, and the provision of open streets; but there were still problems enough ahead to give scope to all the surveyors' resources of skill and knowledge. The problem of the congested areas was one in which hundreds of thousands had been spent, but which was still far from solution. Whether the process of decentralisation could or should be hastened by legislation was an open question; but he was himself no advocate for State interference where it could be avoided. Turning to agricultural land which, so far as we knew, seemed only adapted to growing cereal crops, which, at present prices, hardly paid for cultivation. Statistics showed that our imports of wheat alone amounted to the gigantic annual total of some 26 million quarters, while our payments to the foreigner for milk, eggs, cheese, and other minor products of the farm reached many millions a year. Co-operation might do much to help the farmer in these matters: new markets in large suburban districts and increased facilities of carriage involving less handling, and affording more direct access to the consumer, would do much; but still the lot of the agriculturist, landlord or tenant, was a hard one. He trusted that the old order would continue; but in many cases it would be a severe struggle, owing largely to the reduction of capital. Tenants had lost theirs, and landlords were rapidly becoming impoverished. To show the drift of things, Mr. Buck quoted figures, giving the total area of land under cultivation. During thirty years the arable land had decreased from 18½ to 15½ millions of acres, while pasture had increased from 13 to 17 millions, although the number of sheep had also fallen off. The competition of America, where the farmer could now accept as little as 23s. a quarter for his wheat, had reduced prices far below the remunerative level, and it was but a poor consolation to know that, as the conditions on the other side of the Atlantic gradually changed with the working out of the virgin lands, the export price must rise. This could hardly be in our time. Another difficulty which beset agriculture was the labour question. Whereas in 1870 the rural and the urban populations were nearly balanced at fifteen millions each, the former had now sunk to less than twelve millions, while the latter had risen to 29½ millions. In the country, as in the town, there was a general revolt against the "humdrum" of life. More pleasure and amusement was demanded, as well as shorter hours and easier conditions of work. The long hours, the poor wage, the monotonous existence, the absence of prospect, and the poor dwellings had led the agricultural labourer, in the light of modern education, to rebel against his lot. Whether it would be better by his migrating to the towns was more than doubtful. All that could be done to stay the exodus from the country was to make the conditions of rural life more attractive and to remodel our system of rural education so that it might have some relation to the needs of afterlife. And surely, while we were spending twelve millions in order to satisfy the natural instinct of the agriculturists of Ireland, some sacrifice of public money might well be made to keep our own fields in cultivation; and while our great urban and municipal bodies were doing so much to secure sanitary houses and healthy conditions for the town dwellers, there was room for the activity of the county and district councils in doing something to improve the lot of the agricultural labourer. Cottages on estates had been much improved of late years; but the labourer did not much love these isolated estate cottages, and if he found some attraction in the social life of the village or small town, who could blame him? In his own

county of Worcester, the President said, a good deal had been done in the direction of providing small holdings, and great success had attended the scheme carried out by the county council under the Allotments and Small Holdings Acts. The system of local taxation could not wait much longer for some reform. Taking railways as an example, Mr. Buck showed how great were the anomalies of the present method, and how impossible it was to arrive at any just and equitable incidence of the burden of rates. The growth of the local rates must come in time to have a very serious effect on the value of property, the increase being much greater than the increase of the population, and tending year by year to leave it further behind, while the growth of local indebtedness was becoming altogether beyond reasonable limits. That much of the money was wasted, no one could doubt, and that many of the expensive schemes carried out were in response to the often unreasoning demands of the Government authorities was equally evident. Systems of sewerage were often insisted on for small villages at a cost quite incommensurate with the advantages obtained. The only probable check to this extravagance would be the increasing difficulty of borrowing money, some of the lending bodies becoming already more cautious in advancing money to local councils and others without good security. Municipal trading should, he thought, be jealously watched. In some forms it was undoubtedly sound; but in some others it encroached on what were the legitimate bounds of private enterprise. It was also doubtful whether in every case municipal accounts are so audited as to show clearly the true financial gain or loss from the different undertakings. Next the President dealt at some length with the subject of main roads, predicting that with the advent of mechanical motive power new conditions would arise, and attention must be given to the adaptability of the roads themselves for the increased weight and speed of traffic. Whether the horse was to become extinct on our highways it was, perhaps, early to say; but that the next few years would see a momentous change in the conditions of local travel and transit no one could doubt. A proposal had been made, and seemed to have a solid base of reason, that the great arterial roads should be made national roads maintainable out of Imperial Revenue, and not subject to the present variable and inconsistent regulations of numberless local authorities. With a few words illustrative of the growth of the Institution in importance and in numbers, and an earnest appeal to the members never to forget the great interests of the profession, and above all to proceed with moderation and caution, avoiding sectional jealousies, the President brought to an end his interesting and able address, for which a cordial vote of thanks was passed to him, on the motion of Mr. H. T. Steward, seconded by Mr. C. Bidwell.

FOUNDATIONS.*

By BARON H. T. H. SICCAMA, M.I.C.E.

THE foundation is that part of a structure which supports the part built to fulfil an intended purpose. It is not always clear where the foundation ends and the superstructure begins, for instance, when foundations are utilised for cellars. As a rule, the foundations are below the level of the surrounding ground. The need of foundations indicates that the soil to be built upon is too soft or untrustworthy to carry, unprepared, the weight of the building, for on rock or other incompressible surfaces no foundation is needed. On compact, but still ductile, clays the total estimated weight of the structure gives the measure for the required width of the footings. But soils like clay in level strata, sand, gravel, and stiff loam, where there is no danger of disturbance by running water, may be left out of consideration. Foundations obtain their greatest importance in alluvial soils, where their cost is sometimes equal to that of the superimposed structure. If alluvial soils consisted solely of the inorganic deposits of rivers and streams that formed them, a sufficiently hard bed to carry weights might, in most instances, be found but little below the surface; but this is seldom the case. This is easily understood if the mode of formation of a delta is considered. The growth of a delta at the mouth of a river flowing into a tidal sea is a very complex proceeding, and subject to continual changes. The

first effect is the formation of shallows on each side of the mouth and parallel to the direction of the river current, as it leaves the unsubmerged coast line. These banks consist of matter precipitated from the volumes of river water flowing side ways, and losing their acquired velocity on meeting the heavier sea water. The centre of the fresh-water current continues seaward for some distance, and deposits its silt in the deeper water, forming a bar, from where part of it is either carried sideways by littoral currents or up river again by the incoming floods, and eventually to side shallows. As these warp up more and more, the real river mouth is displaced seaward, the surface gradient of the river becomes flatter, the current slower, the deposit in the river-bed increases, and the bar shallows. The river at last, finding its outlet insufficient, breaks through one of the side banks and makes a new mouth. The old bed being left without sufficient current shallows, and the bar at its mouth, no longer eroded, is raised by the surf acting on it, and overlaid with sea sand pushed up by the groundswell from the sea bottom. As soon as this sand reaches the surface, the sea wind dries and blows it into dunes high enough to keep out high tides; the old river bed is turned into a lake—at first brackish and then fresh. The salt and other constituents of sea water are precipitated or absorbed by plants, reeds, or floating water lilies that soon begin to appear in the stagnant water; first round the edge. This green band broadens, and at last covers the whole surface, and as the plants decay grasses and morass plants cover the floating mass, thickening it; then trees with wide spread roots begin to grow on it till their weight becomes too great for the floating soil. They either sink through to the bottom, or, a gale assisting, are thrown sideways, and so increase the thickness of the now tangled mass of vegetation. So the process goes on for some time, till river-mouth number two undergoes a similar fate to the first, and the river, seeking a new outlet, breaks into the lagoon, and covers the vegetation with layers of silt or sand. The sea in flood finds its way into it as soon as the river breaks through the side banks, kills what remains of plants, and turns the whole into a putrid, festering slough, till through another change by the river it is again cut off from salt water. Then, as soon as the lagoon loses its salt, fresh-water vegetation, marsh plants, reeds, trees follow one another in covering the surface. But below it the hollows and depressions above, harder inorganic strata are still filled in with the remains of the former growth, intermingled with layers of sea clay or sand, river clays, and gravel, or other deposits. In each successively abandoned river-mouth the same goes on, and the delta spreads out fan-wise and seaward, composed of numerous compartments filled with mixed organic and inorganic stuff, and divided by ridges of clay, loam, or sand. Through all these different marshes and lagoons the river continually changes its course, dividing into two or more arms, abandoning an old outlet, or revisiting another old one. It is the mixture of all sorts of stuff in alluvial soils, inorganic and organic, in layers of varying thicknesses, and divided off into areas of irregular form and size, which causes such sites to be the most untrustworthy and difficult to be built upon, and where human ingenuity in the matter of foundations is most called forth. In the early days, when in these swamps and marshes constructions of any weight are wanted, the first idea to suggest itself would be to distribute the load over as great a surface as possible, and this could be obtained by means of a raft. Where timber was abundant, beams could be used; if heavier material were lacking, smaller trees and branches intertwined served the same purpose. Such old raft foundations may still be found under ancient buildings. On the alluvial plains of British Guiana, first brought under cultivation by Dutch settlers, some still exist at the present day. Even old brick windmills, chimney shafts on sugar estates, and the brick lighthouse at Georgetown stand on rafts made of two or three tiers of heavy greenheart or mirva barks. In the fens of the Netherlands and of Northern Germany are still some old farmhouses resting on an even less coherent bed than a thick matting of branches and faggots afford. Probably for the want of better material in the vicinity, layers of dried peat, cut in long pieces and in several tiers at right angles to each other, served as foundations. Not only for buildings were these spread-out supports used, as is proved by part of an old Roman road through

* Read before the Civil and Mechanical Engineers' Society on Thursday, Nov. 5.

a peat bog, discovered some years ago, constructed almost entirely of logs lying close together in two layers, the lowest parallel to the axis of the road, the other across it, and the interstices filled in with small branches—a regular corduroy road, like some in the swampy districts of the United States at the present day. With the same idea, that of spreading the load over the support sand foundations accord, sand compressed in a confined space gives as hard a bed as can be desired for most purposes. In old alluvial soils the different strata, as a rule, increase in compactness as they are lower down, and although the first few feet from the top may be so soft that cattle in wet weather get bogged in it, yet after this nearly liquid mud is removed, layers may be found which, although yielding, are capable of supporting some weights. What this may be must be ascertained by experiment, conditions being so variable that a hard-and-fast rule does not exist. On the green surface, a galloping hare may shake the ground for thirty yards round; a few feet below it the soil will support a ton per square foot; while again, a few rods off, a quarter of a ton per square foot will settle down more than is convenient. Particularly in soils of such varying compactness, sand gives a very good support, provided that it is not scoured away by running water or blown away by the wind. The sand may be piled up on the surface by its weight compressing the mud underneath it; but a more workmanlike way is to remove the upper mud by digging a trench or a pit many feet wider than the footings of the buildings are to be, and going down to a harder layer. This trench or pit is then filled in with sand, which will settle downwards and sideways till an equilibrium is obtained. As the top of the sand descends, the soil round it heaves up in a sort of billow, often higher than the sand mound. Sometimes the sand not only compresses the layers below it, but pierces them and sinks down to a considerable depth. If, then, borings are taken, they show that the sand made a way for itself in a very irregular way, very different at different cross-sections, mostly in the form of a rounded body, bulging out here and there. This bulging out sideways may go on after there is no settling down observed, and then more sand should be supplied to fill up the space. It is curious to note that these after-workings most often occur at night, and not seldom after the ground has been violently shaken by pile-driving or otherwise. When once stability is obtained, and neither sand nor surrounding ground is moving, the top side of the sand can be levelled off and the footings laid on it. The peaty, boggy soils owe their character to the great quantity of water they contain. The trench or pit, therefore, will be filled by it, and the sand tipped in should reach to high above the surface of the surrounding subsoil water, or else it will, for an inconveniently long time, be more like a quicksand than a sand plate. It is even advisable to heap a mound of an extra 5ft. or 6ft. over it to press the submerged bottom layer down, and then, if possible, to lower the water-level. Even then the sand will remain compressible, and it is as well to give it a good ramming-down before laying down the footings, or else the eventual settling will be more than convenient. In the present day concrete is the best material for the footings, laid down in slabs. Where they are to carry a compact structure, like a tower or chimney, a few layers of cement mortar will be sufficient; but where it concerns long walls, iron rods running lengthwise, bedded a couple of inches above the bottom in the concrete of the lower slab, and also a couple of inches from the top of the upper slab, will give greater security against unequal settling and fissures in the wall. The width of the footings and their thickness, and the sectional area of the trench, must be determined by experiment on the spot. A trial pit filled with sand, on which is placed a load of some heavy substance, is not expensive. It should, however, be of sufficient area to give a staple base to the load to be imposed on it, or else this will topple over, or settle sideways, leading to erroneous conclusions. Sand foundations are a very ancient device. Some Egyptian temples in the Lower Nile delta are built on them. The builders placed little images of their gods and holy animals in their foundations, which seems to have answered very well, as most of these temples still stand; but nowadays iron rods, as described, will perhaps inspire more confidence. In recent times sand foundations have again been used; for instance, under railway buildings and workshops on the north

coast of Java, and for lines of railway in Holland; for the Law Courts at Georgetown, British Guiana, and so forth. Another long-known system is that of piles. Even the lake dwellings of prehistoric times were principally built on them: driven in vertically or nearly so, into the lake bottom, and united at the top by heavy timbers, forming a floor for the huts. The same type may still be met with in the Tropics in some coast villages, that stand several feet above the surrounding water or land. The white man's practice at present is to drive the piles down out of sight. It is curious to observe how erroneous ideas have crept in about the usefulness of a pile foundation. It is thought by many that the driving of a sufficient number of piles consolidates the soil, whereas it is just the reverse. The piles themselves, and the shaking during the driving, destroy such cohesion between the different strata as may exist, and churn the whole up into a quagmire. If driven in great numbers they really act like a raft of which the beams are placed vertically instead of horizontally. This applies specially where the piles do not reach a layer hard enough to support them and their eventual load, in which case they miss their purpose, namely, that of supporting a platform, like a table on its legs. Many buildings stand out of plumb, because the whole mass below piles and mud is bodily pushed over through a lateral thrust or inadequate support, a heavy load on one side or an excavation. Some thirty years ago a dock-wall in the Isle of Dogs slid sideways in this way. Besides, by their buoyancy the piles counteract the action of gravity by the friction of the surrounding matter, however porous and soapy. In driving a long pile, the first few feet may go down rapidly by its own weight, and the rate of sinking after that becomes less at every subsequent blow, and then remains stationary. If in the end a hard stratum is not reached, and the pile is left alone for twenty-four hours, then it takes several blows before any impression is made owing to the adherence of the soil to the surface of the pile, and should ramming be stopped after a few knocks only, the idea is given that the pile stands in firm ground. This leads to grave misapprehension, for when the full permanent weight of the building is at last superimposed, a considerable and slowly progressive settling is observed going on for years, till at last the platform over the piles compresses the subsoil sufficiently, and acts, more or less, like a raft. Where piles are not driven down into holding ground, another inconvenience may be suffered, most of the piles already driven being pushed up again, whilst others are put down nearly even after they have already been fastened to the sleepers or stringers that are to support the wall footings. Where piles remain in this way—so to say, floating—it is useless to try to obtain increased stability by driving some in a slanting direction. But in every case the construction of the timber platform is of great importance, not only because it must be able to carry the weight of the walls between the piles, but it must bind these together so as to distribute the load evenly, and also prevent the upper parts of the long masts from bending sideways. Another error is the use of a pile foundation where a hard sand-plate is met with at little depth beneath the surface. An old sand stratum is very difficult to pierce; and where this succeeds, and the piles are not shivered and split before they are half-way down, the sand is all around disturbed and broken up. Not much harm is done where the timbers are constantly submerged in fresh water; but when *Teredo navalis* can get at it, disaster is sure to follow, for the sand disturbed during the operations ultimately settles down again, and leaves space filled with clear water, where the sinister worm soon enters. Where a foundation is intended to support a lock, and the hard sand-plate is not too far down, it is preferable to tip the concrete in it on to the sand bottom, if covered by water, in hard lumps of stale or half-set mortar. In this way a watertight dam is obtained, whereas in the other case some leak is sure to ensue between the sand surface and the lower face of the lock or sluice bottom. Where a sufficiently hard stratum is overlaid by soft stuff to such a depth that the longest procurable masts cannot reach it, wells can be used. This in a way is not a new invention neither. In India wells have been known since time immemorial, under weirs in rows close together, under bridges in clusters. In this way the movable sand or other untrustworthy material is traversed, and the solid or rock bottom underneath is reached. The work is similar to that of sinking

a shaft. A wall is built on a circular shoe, the inside is excavated, and as the wall sinks down other sections are built on top. There are instances in Europe, in Venice, where a wooden cooped well barrel was used, hooped by iron bands, and driven down by the weight of sand-bags arranged round the top. There, as in India, when the well had gone down to the required depth, it was filled with stones or other material. If this filling is not of itself cohesive, there is danger that, when the wooden barrel staves decay, the inclosed substance may spread and the building come down. The cast-iron cylinders filled with concrete of our time are a vast improvement on the older methods, as screw piles are much superior to driven ones, where, for some reason or other they have to stand in sand, as in the case of a lighthouse or landing pier, for the sake of economy. The methods by which cylinders can be sunk are manifold, and the choice depends upon the nature of the soil and the depth to which they are to go down. In clay or stiff loam a bucket and chain or a grab and crane must be used. In sand or soft stuff suction-pumps are preferable. The great bother is to keep the cylinders plumb while going down, which is not always a very simple thing, especially where big stones, or more often old half-decayed logs are met with. If they do not prevent the cylinder going down altogether, until they are removed, they are apt to drive them sideways as is sometimes the case with a bore hole. If very large cylinders or caissons have to be put down to a considerable depth, the soil is excavated through compressed air chambers. On the so-called Potts system, which is costly and rather risky, it is on the whole a favourite device of engineers who need not themselves work in the air chambers. If possible it is always preferable to work in the open air. Even divers should be employed sparingly. Their work cannot always be depended upon: it is slow, dear, and not easily controlled. Any one who has ever been down in a diving dress, will understand this well enough. Dressed in a suit of plate harness, and picking up pins out of the mud during a thick fog, would be something like a diver's work, and yet not half so tiring or dangerous. A new kind of foundation is that of the sand pile. For this a hollow iron shaft is tipped at one end with a loose fitting pointed shoe, and driven down to the proper depth. The shaft is withdrawn, and dry sand run down it. This fills the space left by the shaft as it is raised. The shoe abandoned, very bad ground may be improved and rendered more compact this way, but under locks, sluices or weirs, it is not of much use. Whether "pierre perdue" or rip-rap is a good foundation depends on circumstances. In a breakwater it is part of the useful construction which begins at the bottom. The slope under which a rip-rap mould will stand depend on the size of the stones, and on the exposure of the site. The smaller stones should be tipped in for the centre, the highest on the outside. Mostly rip-rap mounds are used in the construction of breakwaters; but the building of a breakwater is another story, and lies outside our present subject. For quay walls in deep water, such stone mounds will give good foundations, unless the bottom is too soft, and then the stones will go to unknown depths and be lost—as was the case in New Orleans once, also in Rotterdam. In the construction of docks and navigation works it is a mistake to make them too permanent and costly. Nothing changes so continually as the needs of traffic by water, and the best policy is to provide what is needed at the moment, at the least cost, and nasty, if you like, which, in this case, may be called "business." Granite quay-walls, Gothic warehouses, director's names in golden letters on marble slabs, festive opening lunches, with plenty of speeches and lots of champagne, is art, and lies outside the scope of this paper. It would be indiscreet to frivel away more time on this occasion, and therefore it is better to wind up with this remark—that the best foundation is the one which serves its end at the least cost.

Maxwell-town (near Dumfries) Town Council have accepted the offer of Messrs. G. M'Kay and Sons, Edinburgh, to carry out drainage and sewage purification works for the burgh at a cost of £11,441. The system of purification adopted is the bacterial, and the works will be situated on the lands of Troqueer Holm, adjoining the Nith, into which the purified effluent will be discharged. A contract of a similar nature, but larger dimensions, is in course of being carried out for the burgh of Dumfries.

PROPOSED NEW MAIN ROUTES FOR LONDON.

THE London Traffic Commission resumed its sittings on Friday at the Westminster Palace Hotel, Sir David Barbour occupying the chair. Mr. William Edward Riley, F.R.I.B.A., architect to the London County Council, was the only witness called. He said that the municipality of Paris had adopted as a basis of consideration the underground railways of the County of London when they began to scheme their system of direct communication. A unified and complete system had been evolved. There were six distinct lines, all worked on the shuttle system with looped ends to facilitate the return of trains running in each section. There was a difficulty in adapting such a scheme to the existing railways—viz., the inner and outer circles of the Metropolitan and Metropolitan District lines. An ideal scheme for London would be one giving circumferential lines at various distances apart and crossing those diametrically by other lines running across the county and joining the circumferential lines with the central points. The existing and authorised electrical systems, of which only the North-West London and City and Brixton tubes are now in course of construction, are made up of a series of irregular lines which, as at present arranged, do not constitute a unified system. Further, he would suggest broad avenues converging towards the central areas of the county, which would materially increase locomotion facilities. These avenues would provide for underground as well as surface locomotion. The underground systems of all the diametrical lines, both tube and shallow underground, might be looped at the outer ends, as in the Paris system, in order not to obstruct possible future extension. The witness pointed out that the want of rapid communication was particularly noticeable between centres south of the river, the Elephant and Castle, and Waterloo and London Bridge Stations, and centres on the north, among others, Charing Cross, King's Cross, Piccadilly-circus, the Bank, and Ludgate-circus. Certain tube railways now under construction and projected would very materially improve the means of communication. In some cases shallow subways or tramways might be adopted. A route from the Marble Arch to Cricklewood would be of great convenience. The witness detailed an elaborate scheme for linking the railway termini. One great advantage would be to extend the Great Northern and Strand tube from the Strand (its proposed terminus) under the river to Waterloo Station, thus forming an approximately north and south line. Tramways should, where practicable, approach nearer to the centres of traffic north of the river than at present. Additional routes were required (1) from Highgate, via Hornsey and Alexandra Palace, to Tottenham; (2) Clapham Common to Tooting; (3) through Poplar to Eltham, via Greenwich, returning via Lee, Lewisham, New Cross, Deptford, and Bermondsey, and crossing the river to a point near the Monument; (4) from the junction of Sloane-street and Knightsbridge, along King's-road, and crossing the Thames to Putney; (5) an extension to Willesden Junction of the Baker-street and Waterloo Railway from its present authorised termination at Paddington; (6) Walthamstow, through Leyton, entering the City by Bethnal Green; (7) Queen-street, through Peckham, and ending at the Crystal Palace; (8) from the Marble Arch to Victoria and Vauxhall. The lines of forming new and broad thoroughfares might be chosen to pass through inexpensive property, avoiding the purchase of costly interests such as would be required in the extensive widening of existing streets. By acquiring sufficient property on both frontages and providing for surface tramways and shallow tubes a return from the necessarily heavy outlay involved would be obtained. The witness, continuing, suggested (1) a north and south route, north four miles long, and south 6½ miles (within the county), from Southampton-row northward to Finsbury Park, and southward to near Sydenham Station; (2) a north-east and south-east route, length within county, north-east 4½ miles, south-east 8½ miles, the former beginning near the Tower of London and terminating at the county boundary beyond the south end of Hackney Marsh, and the latter from the southern approach to Tower Bridge via Eltham to the county boundary at Westwood; (3) a south-west route, length 4½ miles, from the western end of the Victoria Embankment to Barnes

Common; (4) west, length two miles, from Uxbridge-road to East Acton; (5) north-west, 2½ miles, beginning at Portland-place to the county boundary north of Paddington Recreation Ground. The usefulness of the avenues would be greatly increased by their extension across the central area in cases where that was not shown. Comparing the cost of housing at the Council's estate at Tooting and at the Bourne Estate (Reid's Brewery), he said that a family of six could be housed at Tooting for about five-eighths of the cost of the land only at the Bourne Estate.

STEEL SASHES, METAL CASEMENTS, AND GATES.

MESSRS. HAYWARD BROTHERS AND ECKSTEIN, LTD., 187-193, Unicorn-street, Borough, S.E., have just issued a new illustrated catalogue of casements, sashes, collapsible gates, fireproof floors, and other fittings and appliances, which have a special interest for architects engaged in warehouses, factories, railway business premises, stables, &c. The metal casements, illustrated are of improved type, and represent outward-opening and inward-opening casements, side and top hung. The full-size details of these ought to be of value to architects and others in specifying and ordering. These show in section a simple bar metal frame and casement. The prices are moderate. Thus, for a height of opening of 4ft. to 4ft. 6in. the price of style A, fitted with brass cockspur, plate, and stay, is 30s. 6d., and of style B 24s. 6d. Transom lights, fitted with gunmetal stay, &c., are illustrated. A stronger section, well finished, costs a few shillings more, while a still stronger section, No. 16, with middle rib and moulded casement frames, is suitable for any purpose. Horizontal and vertical pivot-swinging casements are useful in some positions. These are numbered according to strength and finish, and full size details are given in each case. Folding casements with meeting stiles are well adapted for dwellings and cottages where there is no mullion. In every instance the widths can be increased and circular heads substituted at extra cost. Other illustrations show hepper ventilators with fall-back casements. The fittings, handles, stays, &c., are of various improved forms of iron, brass, and gunmetal. Hayward's new improved and patented "putty-grooved" wrought steel sashes are neat in appearance and strong. Several sections of bars are given. The mitred joints are made by special machinery. Fixed as well as opening sashes are made, and circular and semi-circular sashes. By referring to the tables any size or description can be found. Cast-iron sashes of two patterns are also made. Hayward's "Pludelux" prismatic glass for use in sashes, cut to any size up to 80in. by 60in., is an admirable light refractor, and is made of sheets one side moulded into fine corrugations; they can be fitted into wrought-iron or wood frames. The "Pludelux" prismatic glass is made with different angles, and can be applied with great advantage in the upper sashes of windows or above transoms, as shown in a sectional view. The New Surrey Works of Messrs. Thos. Green and Sons' new premises, Southwark-street, are fitted up entirely with Hayward Brothers and Eckstein, Ltd., metal casements and sashes, a view of which premises is given. The section on Hayward's patented "steel collapsible gates" illustrates several applications. They are useful for entrances to shops and buildings, lift openings, windows, &c. The double H section is adapted for large and heavy gates. Few modern buildings are complete without the collapsible gate; they are made of several types, according to the number of lattices, and several pages illustrate these, so that any description can be specified with the aid of table of price list, which gives the full height and width of gate. The collapsible steel window-guards and screens are useful protections. Photo. views of these gates are given. Hayward's iron sliding doors, with interlocking rebate angle-irons at sides, and pivot-hung doors, single and double, form a very important section. The lifts and hoists and well-known Hayward's cellar-flaps are too well known to need description. The catalogue is handsomely got up, and is profusely illustrated.

As a result of the recent inquiry, the Littleborough Urban District Council has received the formal sanction of the Local Government Board to a loan of £1,370 for the purposes of electric lighting.

IRISH BUILDING STONES.—II.

ARMAGH.

THE rocks in this county are Lough Neagh Beds, Triassic and Permian, Carboniferous Limestone, with sandstone and shales, Silurian sandstone and slates, metamorphic rocks, granite, basalt, and other igneous rocks. Armagh is built on Triassic sandstone, Permian breccia, and Carboniferous Limestone, with Lower Carboniferous sandstone and shale. Lurgan is on basalt, and Portadown on basalt and alluvium. In the extreme north of the county, bordering Lough Neagh, there is found a series of beds consisting of plastic clays, sands, and subordinate layers of lignite and clay ironstone, the whole being much more recent than the basalt adjoining, and which forms the southernmost portion of the great Antrim sheet; these beds have received the distinctive name of the "Lough Neagh series." Towards the east, the clays and lignites rest on basalt and white limestone; towards the south they cover up the Triassic rocks and Carboniferous Limestone; they are of very unequal thickness, having been proved to a depth of 270ft. only, though from the lamination, which Kinahan presumes to be a false stratification, the thicknesses should be as much as 2,000ft. These beds, like the older rocks, have suffered much denudation, and their surface area was once considerably greater than it is at present. The Lough Neagh series are remarkable as having furnished much silicified wood and Lough Neagh bones. The silicified wood was noticed centuries ago, and the common belief was that Lough Neagh water had the power of petrifying wood. Both the wood and the bones come from the lignite, as portions of the latter are frequently found completely silicified, and lignite when bleached is exactly like a Lough Neagh bone. The silicified wood and the bones represent various stages of the silicification of lignite; all the beds are at present provisionally classed as Pliocene, though Jukes was in favour of classing them as Pleistocene. Other geologists think the upper beds are still more recent, and that they are of the same age as the Drift of the surrounding country. The whole northern portion of this county was once covered by the waters of Lough Neagh; but earth movements caused a slight tilting up of the southern end of the lake, and this has laid the bed dry in this direction, exposing the clays and lignite of the Lough Neagh beds. Triassic rocks are found in an irregular tract stretching eastward from the Valley of the Blackwater to the basalt of Portadown. There are no good surface exposures of these rocks along their southern margin; but well-sinkers find them to be soft red sandstones, probably representatives of the Bunter beds. In a few places along the Valley of the Colleen red shales and reddish-grey sandstones are found, which apparently belong to the Keuper beds. There are extensive surface exposures on the northern side of these Triassic rocks, and they are all Bunter sandstones associated with thick beds of mottled clays and shales. Formerly these New Red Sandstones, or "Red Free," as they are called, furnished much building stone; but latterly the quarries have been abandoned, and Scotch and English stones used instead. A quarry at Grange, north of Armagh, furnished the fine sandstone used for walling in the cathedral restoration of 1835; but foreign sandstones were used for the dressed work. Near Reilburn, close to Armagh, a calcareous breccia was quarried for flagging; it was found in the bottom of the Trias, or so-called Permian beds. Strata consisting of about 20ft. of sandstone, breccias, and conglomerate are found covering the limestone rocks south of Armagh; these were first noticed in the old marble quarry there. On the north-east of the city, in the valley of the Blackwater, near Benbush, similar red and purplish rocks are seen, the whole of which are classed as Permians by English geologists. Professor Kinahan points out that the red sandstone contains no fossils which would give a clue to their geological position; but then the associated limestones have fish remains of decidedly Carboniferous age, similar to those found in the Ulster Culp and the Burdie Home Limestone, Scotland, so that the real age of the so-called Permian strata is, after all, doubtful. Though these beds were formerly much used for building, the quarries are now all closed. Carboniferous Limestone is found on the north-west of the county, its southern boundary being a line running almost north-east and south-west, a little to the south of the City of Armagh. Some of the rocks are like Lower Limestone shale and Old Red Sandstone, others like the upper

limestone, which latter Professor Hull considers to be Permian. The chief limestone quarries are Ballygansey, Mr. G. Thompson (11 men); Farmacally, Armagh, Mr. P. Corr (11 men); Lisadian, Mr. G. Thompson (5 men); Navan, Armagh. Messrs. Leeman (3 men); Mullen, Tynan, Mr. Greacen (2 men); and two quarries at Enagh worked by Mr. A. Busby and Mr. J. McAree. The Armagh marble quarry in these Carboniferous Limestone rocks was at one time very extensively worked for building stones and marble, the latter being used chiefly for chimneypieces and ornamental work. There were four kinds of marble found in this quarry, the uppermost being a bluish-red stone 10ft. thick, in beds of from 1ft. to 3ft.; a bed of rock 3ft. thick called white marble, but really a light whitish grey, came next; then 2ft. under the latter was a shell marble about 1ft. thick, purple-brown, variegated with green and yellow; the lowest being thrush marble, a purplish rock mottled like a thrush's breast. The Armagh marbles have been completely displaced by Cork reds and foreign marbles, the latter chiefly Belgian. The limestone was used in building the R.C. Cathedral in Armagh; Tynan quarry and one at Killyles furnished limestone for the bridges on the Ulster Railway. Limestone from quarries at Aughnacote and Carrickaness were used in building Roxburgh Castle, and that from Farmacally in the Primate's Palace, Armagh. Ordovician (Cambro-Silurian) rocks cover the greater part of the county; they are slate rocks with associated beds of grit. The former are preferred for walling, and a good quarry at Carricalane furnished all the walling-stone used in Gosford Castle. At present neither the grits nor the slates are much used for building. Igneous rocks are found in this county west and south of Newry; they are probably the roots of the great basalt rocks of Antrim, Down, and here. The most important quarry is that at Altnaveigh, near Newry, worked by the United Granite Company, Ltd., with 58 men. The felspar in this rock is fractured throughout, and the outlines of the crystals are exceedingly ill defined; the mica is granular and less scaly than in the Goragh Wood granite. A peculiar arrangement of the mica in irregular lines gives a gneissoid aspect to the rock. Brown sphene is abundant, and a few hornblende crystals may be seen in places. There are no other accessory minerals. This is a grey granite. Bessbrook granite is quarried near Newry by Mr. A. Robinson, who has two quarries, giving employment to 26 men. The felspar in this rock is plagioclase pheno-crystallised, more angular than in the Bessbrook or Goragh Wood granite, but still ill defined. Mica is present in extremely minute particles, which gives a mottled appearance to the rock; it is biotite. The quartz is fine-grained; sphene and hornblende are accessory minerals, the colour being generally dark grey. This granite appears to have been much disturbed in cooling. Goragh Wood granite is called by Kinahan a spotted elvan; it is worked by the Newry Quarries, Ltd., with 17 men. The felspar in it is plagioclase, the crystals of which are fractured and imperfectly formed throughout; the interstitial quartz is present in much less amount than the felspar, and the mica, which is solely biotite, is present in badly-formed crystals, which are much abraded; no accessory minerals can be seen by an ordinary hand-lens, and the rock taken altogether may be described as granitic. The other granite quarries are Carrin Hill, Killeavy, The Newry Quarries, Ltd. (57 men); Corrinshigo Newry, Messrs. Murray and Sinclair (26 men); and another quarry at the same place worked by Messrs. G. White and Co. (9 men). All the Armagh granites are quarried near Newry; they are light and dark grey rocks of more recent age than the Chalk, they make good paving setts, and have been much exported to England. Basalt is quarried at Killycomain, Portadown, Mr. J. Collen (15 men); Glenane, Messrs. Gray and Sons, Ltd. (5 men); Annacramp, Mr. J. Scott; and Tullyhugh, Mr. W. H. Atkinson. There are 336 quarries shown in this county on the Ordnance maps, but there are only 19 worked at present which are over 20ft. deep, and therefore subject to Government inspection.

CARLOW.

The rocks in this county are Coal Measures; Upper Carboniferous Limestone (303); Lower Silurian Strata as deposited and subsequently altered; Intrusive and Metamorphic Granite, and Elvan. Carlow Town is built on that division of the Upper Carboniferous Limestone known as Calp, Leighlin Bridge on Calp and Magnesian

Limestone, Bagenalstown on Magnesian Limestone, Granite, and Calp. It must be noted that the Magnesian Limestone referred to here is not that of the Permian formation so well known in Yorkshire and Durham. In Ireland this is absent; but many beds of Carboniferous Limestone have been changed to Magnesian Limestone since they were first deposited, apparently by some kind of metamorphic action. Calp is an earthy black limestone or shale, commonly used for rough walling. Nearly the whole of this county is covered with granite: a line drawn through Carlow and Bagenalstown roughly marks its western boundary. Coal measures are the newest rocks found here, and they lie on the extreme west to the north and south of Old Leighlin, where they cross over the county boundary from the Kilkenny and Queen's County Coalfield of which they form part. The associated sandstones and grits have been extensively quarried for building, and they proved good weather stones suitable alike for dressed work and walling; a fine example of the sandstone may be seen worked into ornamental dressings in the doorway of old Killeslin church, which stands a few miles west of Carlow town on the Castlecomer Road in the Queen's County. These coal measure sandstones are silicious, and of a brownish-grey colour; the beds lie horizontally in layers of from 10in. to 24in. thick; quarrying, therefore costs little, and the stones come out of the quarry as well bedded and jointed as if they were specially dressed for building. All these sandstones belong to that division of the Carboniferous rocks known in Ireland as the "Carlow flags," as they lie directly on the limestone they probably represent, the Yoredale rocks of the Northern English counties. The Carlow flags of commerce are quarried in the adjoining county of Kilkenny, none being worked in Carlow at present; they are extensively used for rough flooring in Ireland, where such work is known as "flagging," in England it would be called "paving"; but "paving" in Ireland means a floor laid with small limestone boulders, such as are dug out of the Eskers. Carboniferous Limestone runs in a narrow belt from Carlow town to Bagenalstown, between the Granite and the Coal Measures, where it is seen overlying the former, and dipping or disappearing under the latter. Where the limestone rests on the granite, the former is unaltered, therefore the Carboniferous sea-bottom must have been a denuded granite surface when the calcareous mud was thrown down on it, and the adjoining granite hills were islands in that sea. This view is supported by the fact that granite blocks are sometimes found included in the limestone, these blocks having been derived from the main granitic mass. The typical Carboniferous Limestone of Central Ireland is a semi-crystalline, bluish grey, nearly pure carbonate of lime. In this county, however, it is chiefly a dark iron-grey dolomite, though limestones of the Calp type may be found in some places. At Browne's Hill, close to Carlow town, the limestone is a dolomite; but as it is much honeycombed with drusy cavities—that is, holes filled with sparry substances—it is only fit for rough work. A 4ft. bed of fine-grained bluish-grey compact stone found in the same quarry makes good dressed work in walling or facing. The Lower Carboniferous Limestones of this and the adjoining counties are nearly always bedded dolomites, but that they were originally deposited as such is not known for certain. Some geologists think they were once like other normal calcium carbonate rocks, and that they were subsequently altered by the introduction of magnesium carbonate, and the removal of a corresponding amount of calcium carbonate. However this may have been, both types of rock are constantly found interbedded in the Irish limestones. In Carlow town, two quarries were formerly worked—one in Montgomery-street, and the other in a suburb called Graigue, at the other side of the Barrow, and really in the Queen's County;—both in limestone rock. In the Montgomery-street Quarry there were beds 7in., 2ft., 3ft., and 18in. thick, all of which yielded a kind of marble, the thinnest layers furnishing the best quality. In the Graigue there was a 5ft. bed of crystalline limestone, and under it a 2ft. bed of black limestone, which was really a good marble. All these beds were worked for tombstones, the principal markets being in Dublin and Waterford; and so celebrated were the quarries at one time, the stone they produced was eagerly sought after for monumental purposes all over Ireland; but this

industry has now died out, and the quarries are closed. At Cloghennan, two miles and a half south-west of Carlow, a bed of good black marble spotted with white was worked in the upper limestones immediately under the Coal Measures. It somewhat resembled the curious crinoidal limestone of Clonmacnoise, in the King's County; but its texture was not so fine as that of a similar rock quarried at Royal Oak, near Bagenalstown. The principal quarries now in the Carboniferous Limestone are at Royal Oak: they are worked by M. Brennan, M. Timmins, and John Roach, over twenty men being engaged in them. Limestone gravel taken from these quarries (supposed to be the best and purest from clay in the county) is sold as raised for 6d. per ton. Ballyellin Quarry has recently been closed; it was worked by W. Devine. Though the Milford quarry is now worked by road contractors, stones of the largest dimensions ever likely to be wanted in building could be easily obtained in it, and of good quality. The weathering properties of stone from Milford quarry can be judged from an examination of the railway bridge at Powerstown, which is built with it. A good quarry at Brown's Hill yielded a dark-blue limestone, which made excellent ashlar walling; but the presence of drusy cavities in it unfitted the stone for use in dressed work. It was, however, extensively used in many of the buildings in Carlow town. Nearly all the limestones referred to are sold by the ton weight at the quarry undressed. Lower Cambro-Silurian, or Ordovician rocks, are found on the east side of the granite range between Cloncal and Kildavin. They are part of the great tract of Silurian grits, flags, slates, and shales which occupies most of the counties of Wicklow and Wexford, and they probably represent the Llandeilo rocks of North Wales. Where these water-formed rocks are in contact with the granite, and for several hundred feet round, they are altered or metamorphosed to schists and gneiss, in which crystals of andalusite, staurolite, schorl, felspar, and other minerals are plentiful. Though none of these older rocks are at all suitable for dressed work, the schists and slates are used locally for rough walling, but there are no quarries of any importance in them. With the exception of the small tract of Silurian and older rocks just described, the whole eastern part of this county is occupied with granite, which forms part of the celebrated Leinster range, this being 70 miles long and 17 wide, the greatest surface exposure of that rock in the British Isles. Like all other granites, this was consolidated under enormous pressure, for if the molten matter from which it was derived had reached the surface, it would have cooled there as a porous vesiculated pumice, a basalt, or some other igneous rock which would not have been granite. The only conceivable pressure to which this rock could have been subjected was that of the superincumbent Cambro-Silurian strata, and these were then of enormous thickness. All this immense mass of rock has since been removed, and with it much of the granite intruded and forced up through it. The age of the granite range is therefore easily determined; along its eastern boundary the old Silurian rocks are forced upwards, dislocated and altered by the intrusive granite, whilst along its western side the consolidated and denuded granite is covered with unaltered Old Red Sandstone and Carboniferous Limestone: hence this mountain range is older than the sandstone and newer than the Silurian schists. A close examination of the structure of the rocks here shows that granite of at least two distinct ages are mixed together, for the original mass which invaded the Cambro-Silurian strata was itself invaded by another and later eruption. Leinster granite is remarkable in that it possesses a structural peculiarity which gives it grain, and this reduces the labour in working it very considerably, for the rock splits readily along planes nearly at right angles to each other. It has been assumed here that granite is an igneous rock; but its origin has for a long time been rather a vexed question with scientific men. From the manner in which it is found to penetrate every rock with which it comes in contact, geologists assume for it an igneous origin, but that a great abundance of water is absolutely necessary to its formation is a sufficient reason with chemists to claim for it an aqueous origin; indeed, many of the latter look on it as a chemical precipitate from aqueous solution. It is undeniable that the quantity of water found in granite gives it a specific gravity due to aqueous and not to igneous solution, and the presence of large quantities of

water in one of its constituent minerals, mica, is admitted to be inconsistent with the theory of igneous fusion. Haughton, a celebrated authority on the subject, believed that although granite is usually a Hydro-Metamorphic rock, it may occasionally be the result of Pyro-Metamorphic action. Hydro-metamorphism is the alteration of a rock originally fused by the action of the water at a high temperature, but not sufficiently high to melt it, and pyro-metamorphism is the change undergone by rocks originally stratified, but subsequently acted on by heat, so as to be transformed into what are commonly known as metamorphic rocks. In the infancy of geology, granite was supposed to be the foundation, and consequently the oldest of all rocks; but it is of all ages, from the time of the original cooling of the earth's crust down to that of the eruption of Mount Pelée. Granite may be intrusive or metamorphic. For dressed work intrusive granites is preferred to that of metamorphic origin, as there are lines in the former, recognisable by a trained eye, along which the stone readily splits, and which lines or "grain" are not found in the metamorphosed rock. In this county a coarse kind of granite, which weathers badly, is found around Hacketstown and near Tullow; the good building stones are quarried along the western boundary near Murney and Bagenalstown, where surface blocks are also found which afford good working and lasting stone. In Carlow town granite has been used extensively for walling and dressings, including in the latter moulded work, the surface being finely punched or chiselled; many of the blocks are free working, and others are hard and refractory, so that a careful selection is necessary to secure good weather stones which can be easily worked. There is so little demand for building-stone at present, owing to the rapid decrease in the population, that two quarries only are worked for granite, and they afford employment for not more than four men. One quarry is at Boherduff, and the other at Graigue-na-Spidogue. The Graigue granite is a whitish grey, rather coarse-grained felspathic stone; it may be seen in the Bruen monument, and in the new church at Carlow. Window sills, mullions, quoins, and stone for every kind of building work may be obtained in these quarries, the prices being in proportion to the sizes ordered. Window sills 12in. by 4in. and from 2ft. 6in. up to 4ft. long are 4d. per lineal foot, quoins from 18in. to 2ft. long, 12in. high, and 12in. head, are about 6d. each, quarried in the rough and not including carriage. Large stones are expensive. For instance, landings about 5ft. square and 7in. thick cost in the quarry £3, many such stones were sent to the Curragh Camp. There are no modern appliances in the quarry for dealing with large stones: the nearest railway station is Carlow, which is five good Irish miles from the workings. Mr. J. Scully and his brothers are the quarrymen and owners, the property having been "in the family" for many years, so that anything they do not know about the working of Leinster granite for building purposes is not worth knowing. The Borris railway station is built with a white granite quarried in the locality. The cream-coloured granite of Lough, a fine, compact, curiously-spotted stone, was used in the window and door jambs and arches of Carlow Church and the new entrance to Oak Park. The same quarry often yields different granites. For instance, one at Tullowpheline furnishes a hard stone, quartz being the predominant mineral, and another stone in which felspar predominates; hence it is much easier to work. A quarry at Whitewalls furnished much of the granite used in Carlow; but these quarries are now closed, and the trade with Dublin, which was at one time very extensive, has completely ceased. Of fifty-six quarries shown on the Ordnance Maps, only six are now in work. Formerly erratic granite blocks found scattered over the granite main mass, as well as over the adjoining stratified rocks, were much more numerous than they are at present, for these stones were sought largely by builders to make door and window sills, pillars, field rollers, and gate posts. Kinahan remarks of these stones that the lengths of the scantlings supplied by them, and their strength over long bearings with small transverse dimensions, were remarkable; indeed, the best building stones were generally obtained from these erratic blocks. On the whole, it may be said that Carlow granite is friable, or coarse, and that the best quarried stone has always been obtained from quarries near Bagenalstown. Some fairly good granite can be obtained at Palatine,

on the Wicklow boundary. This stone, though coarse-grained, is regularly jointed. A granite quarried at Ballyloo is also regularly jointed, but as it has a tendency to break up into cuboidal fragments, it is not safe to use it in building. In Bagenalstown granite was commonly used for dressed work, much of it having been obtained from surface stones. In 1845 a large quarry was worked in Ballybegs, but it was not a success, for the stone was grey, felspathic, micaceous, and showed iron stains on the face of the work in weathering—a common fault with many grey stones. Granite of coarse grain, felspathic, with plates of black and grey mica and lumps of semi-crystalline quartz, is found at Kildranagh, a place about six miles north-east of Bagenalstown. Three miles north-east of the same town, at Newton, a grey granite was quarried; the stone was felspathic and micaceous with schorl, and contained lumps of pink felspar. Kilcurragh was another quarry near Bagenalstown. It yielded a loosely-aggregated, nearly white granite, the constituents being a white opaque felspar, whitish quartz, and grey mica. Elvans of fine grain are found in places along the margin of the granite, and in the schists there are other varieties more or less granitoid in character. The finer sort was much used by the old builders, for they are often found worked in with limestone to face the walls of ancient buildings; Wells Church, near Bagenalstown, and Ballymoon Castle afford examples of this kind of work. On examining the elvan in the church it is found to be much weathered; but in the castle most of the stones have a film of quartz on the weathered face, which has preserved them; but where this coating is wanting the stones have been disintegrated to the depth of an inch or more. Where protected from the weather, elvan makes remarkably fine work, and it is very durable.

CAVAN.

The rocks in this county are Keuper Marls; Permian Beds; Millstone Grit with coal seams; Yoredale Shales with ironstone overlying yellow sandstones; Carboniferous Limestones and Sandstones; Ordovician or Transition Rocks between Upper Cambrians and Lower Silurians. Cavan is built on Lower Carboniferous Limestones and Sandstone; Belturbet, Lower Carboniferous Limestone; Cootehill and Bailieborough, Ordovician beds. North-east of King's Court, at Derrynasrobo, there is a bed of gypsum in the Permian rocks, but it is not worked for building or any other purpose. The Millstone Grit was at one time worked into millstones, and there are good building stones in the same rocks on the Cuilcagh and Benbrack Hills, but they are "out of the way," and there are no ready means of transporting blocks to any market that might be found for them. The only good limestones in the county is that quarried at Crossragh on the north side of Lough Sheelin; there are several small quarries near Cavan, but the stone is not liked for dressed work. Crom Castle was built with a fine crystalline dark grey limestone from Belturbet; it works fairly well, but it splinters. The stone is found in thick and thin beds, which may be selected for the work required—a circumstance which always effects a great saving in labour. There was a good limestone quarry at Mount Nugent, but this and other quarries near were closed, as building stone is more easily obtained from the adjoining county of Meath. Yellowish grey sandstones belonging to the Lower Carboniferous rocks have been worked at Latt and Ballyconnell, near Cavan. Though they are very silicious, they work freely and are durable. These sandstones have been used extensively in Cavan; they were also used in Cullen College, built in 1871. The Ordovician rocks, which occupy a considerable area in this county, are generally slaty; they make good common walling, and are extensively used for this purpose at Bailieborough, Ballyjamesduff, Cootehill, Virginia, and other towns, sandstone or limestone being used for quoins and other dressed work. In the south-west of the town of Cavan there is a small area of fine-grained grey-and-pink granite; but it is not suitable for building, as it is much broken up by irregular jointing. The Cavan granite was introduced after the deposition of the Ordovician rocks, and before the Carboniferous Limestone was formed: hence it is really Silurian; associated with it are numerous dykes of whinstone and felstone, which cut through the bedded Silurian rocks. For dressed work limestone is used exclusively through the county. The Ballyconnell

stone was used in Ballyconnell bridge, lock, and lock-house, and extensively in works for the drainage company; it is a bluish-grey, hard, calpy limestone. Belturbet barracks were built with Clowinny stone; Blackwater bridge and several other bridges were built with stone quarried at Doon; Drumellis, Keady, and Killycrin furnished stone for the Cavan court-house, infirmary, and union workhouse. There are no less than 748 quarries shown in the Ordnance maps of this county, and there are now only two in work, and they give employment to three men.

DESIGNING IRONWORK.*

THIS little work on rolled steel joists, &c., forms Part IV. of the second series of these manuals, the previous parts being devoted to steel box girders, built-up stanchions, and cisterns and tanks. The present part contains historical data on rolled steel joists, compound girders, concrete and fire-resisting materials, and is accompanied by calculations and working drawings for a fire-proof floor. The author, Mr. Henry Adams, M.Inst.C.E., F.S.I., &c., is professor of engineering at the City of London College. Some interesting data are furnished. According to A.D. Dawnay, rolled iron joists were first made in 1849 by the Providence Works in Belgium; in 1850 the invention was introduced into France. In 1851 Fox and Barrett began to substitute rolled iron joists for cast-iron girders, which up to that time had been used in this country. Several years later, in 1865, the profession began to take the rolled joist up. The other main systems for floors and reinforced concrete are noticed. Data on the relative strength of wrought iron and mild steel are given. Measures Bros. show by a table the comparative strength of steel and iron joists of the same sectional dimensions. The ratio between the two is as 8 to 5, but the estimate varies according to other authorities. The specification tests for mild steel are of value. The formula for strength of rolled joists supported at ends when the span does not exceed 20 times the depth is $W = C \frac{a d^3}{L}$, when W = breaking weight in centre in tons of web, a = net area in square inches of one flange + $\frac{1}{2}$ in., d = depth in inches, L = length of span in feet, C = constant = 7 for rolled iron joists, 6 for compound girders with equal flanges, 10 = for rolled steel joists. For rolled joists examples are given. The author enters into the method of finding the moment of inertia, bending moment, shear stress diagrams, and the instruction, and worked out examples for a fireproof floor for public hall, accompanied by detail drawings, will be found of much value to the student. The book is packed with useful data and formula, and particulars of fire-resisting materials, plastering, partitions, fire-resisting window glass, fireproof floors, &c. The price of this little work is 2s.

CORNICES OF STEEL AND TERRACOTTA.

THE Land Title Building, Philadelphia, of twenty-three stories, has many features of constructive interest, which are illustrated in a recent number of the *Engineering Record*. The columns, floor beams, girders, offset walls are described. We here confine attention to the cornice. The great lever arm and weight of the cornice develop a heavy bending moment, which has required special construction. "This is afforded by riveting to each side of the column a $\frac{3}{4}$ in. plate about 2½ ft. wide and 4½ ft. high. Along the upper edges are riveted a pair of 12in. channels, which form long metal cantilevers supporting the cornice; 12in. and 15in. channels, parallel to the wall, are web-connected to these cantilevers, and to the lower part of the jaw-plates, and to them are secured the suspension rods and anchor bolts for the terracotta blocks. 12in. and 8in. channels below the wall girders serve as lintels over the windows, and support the lower courses of terracotta in the cornice." A section of the construction is given, from which it appears the total projection of cornice is 6ft., and a depth of about 9ft. from the top fillet of cyma to bottom. The cantilevers and sections of terracotta blocks, which are hollow, are shown in position. It is nothing un-

* Designing Ironwork. Second Series. Part IV. Rolled Steel Joists, Compound Girders, Concrete, &c. By HENRY ADAMS, F.S.I., M.Inst.C.E., M.I.Mech.E., &c., Professor of Engineering, City of London College. London: 60, Queen Victoria-street, E.C.



A GRANOLITHIC CHIMNEY SHAFT.

usual now to find architectural projections and details of this kind constructed on a system of iron or steel framing with an ingenuity worthy of a better cause. Architecturally speaking, we may question altogether this method of constructing ornament. Did the inventors of the cornice ever dream that in the 20th century buildings would be erected of great height, crowned by cornices which exercised the engineering skill of the architect to carry? We can understand solid built cornices of stone, supported on a core of York stone, or even terracotta mouldings carried on an oversailing course of brick or stone; but to construct a cornice with projecting steel cantilevers, from which the lower members are carried by suspension-rods, is a questionable mode of making architecture, that reminds us of "stagey" contrivances. It is really "constructed decoration" with a vengeance.

A GRANOLITHIC CHIMNEY SHAFT.

WE give an illustration of construction which is somewhat of a novelty in London, where the Building Act requires all furnace chimney-shafts to be carried up throughout in brickwork, with a taper upwards of 2½ in. in 10 ft. in height. In this instance, however, Mr. P.

Stuart (of Stuart's Granolithic Stone Co., Mill-wall) wished to prove that his well-known artificial stone (granolithic) could be rapidly and economically used for stonework of a decorative character, and therefore obtained the London County Council's sanction for its employment in this tower-like design. It has just been completed at the company's premises at Glengall-road by Messrs. Stuart's own workmen, and owing to the repetition of the blocks, and the rapidity with which they are cast and set, only six weeks have been required for its erection on the previously-prepared foundation, and it has a very effective appearance. The architects are Messrs. Stock, Page, and Stock.

CHIPS.

Among the newly-elected mayors of boroughs are several well-known architects, including Mr. Walter Emden, L.C.C., past-president of the Society of Architects, at Westminster; Mr. Lewis H. Isaacs, F.R.I.B.A., re-elected for Kensington; Mr. Charles Lynam, F.R.I.B.A., F.S.I., chosen at Stoke-on-Trent; and Mr. Albert Edwin Sawday, F.R.I.B.A., at Leicester. At Ipswich, the new mayor is Mr. Fied Bennett, builder, the most recent addition to the aldermanic bench of that borough; at Wands-worth Mr. John William Lorden, builder and contractor, has been elected; and at Tynemouth the choice has fallen on Mr. John Phillip Spencer, civil engineer, and from 1870 till 1880 the borough surveyor of that town.

In rural districts in Northumberland and Durham the surveyors report that the cost of carriage of road materials by motor traction is little more than half that of horse carriage. In the case of the Darlington urban district the outlay on haulage has been reduced from £111 to £63 per annum as a result of the change.

A new Established Church for the village of Dalmaur was recently opened. The new church, which is situated at the west end of the village, is designed in a Free treatment of Perpendicular, and is built of white stone. The building has transepts, and a chancel with organ-chamber. Over the entrance vestibule is a gallery. The church has cost about £5,000, and is seated for 800 worshippers.

The engineer's report (issued as a Parliamentary paper) on the Peterhead Harbour of Refuge Works for the year ending March 31 states that the daily average number of men employed has been: Freemen, 173; convicts, 167. It was originally contemplated that 500 convicts would be available daily. The average number during the last eight years has been 196.

St. Andrew's Church, Alexandra Park, Muswell Hill, was consecrated the other day by the Bishop of London. The church, which stands in the midst of a fast-developing neighbourhood, cost £8,000, of which £4,000 has already been received. Seating accommodation is provided for 800.

Preliminary operations in regard to the intended electric tunnel between North and South Shields are about to be commenced. The architect for the promoters, Mr. Fred Rennoldson, has asked and been granted permission to carry out boring operations near the riverside at a point close to the South Shields Corporation Staiths.

The town council of Salford have resolved to apply to the Local Government Board for sanction to borrow £3,117 to cover the cost of the overhead equipment of the tramways in Middleton-road from the Manchester boundary at Cheetham-hill to the Middleton boundary.

Lincoln's Inn Chapel, which has hitherto been lighted by means of candles only (gas never having been introduced there), has now had the electric light installed. A carved oak inlaid panel, in harmony with the surrounding woodwork, has been placed on the wall at the back of the pulpit, and the old sounding-board, which was removed in 1859, has now been replaced over the pulpit.

The health department of Newcastle-on-Tyne Corporation have recommended the extension of the hospital at Walker by 75 additional beds, and a nurses' home to be erected adjoining the hospital. It is estimated that the cost will be about £50,000. Extensions are also being made at the smallpox and isolation hospital on the Moor at Newcastle, at an expenditure of about £3,000.

A stained-glass window was unveiled at the morning service in Crediton Parish Church on Monday. The window is in the east end of the south choir aisle. The subject is the Resurrection, treated in a 15th-Century manner. The whole is surrounded by canopy work.

To meet the needs of Roman Catholics in Leven, Methil, and Buckhaven district, a chapel-school has been erected at Crossroads. Mr. Tod, Wemyss Castle, prepared the plan of the building, which is Gothic in style. On Sunday the chapel was dedicated to St. Agatha by Archbishop Smith.

THE LATE MR. SILVANUS TREVAIL.

A PAINFUL sensation was created on Saturday as it became known that Mr. Silvanus Trevail, of Truro and Westminster, who has only just completed two years of service as President of the Society of Architects, had been found shot in a Penzance morning up train on its arrival at Bodmin-road. At the inquest this week a verdict was returned of "Temporary insanity." The funeral took place at Luxulyan Church on Tuesday, and was very numerous attended.

Mr. Silvanus Trevail, F.R.I.B.A., J.P., was born at Luxulyan in 1851. After passing four university local examinations, two in honours, and taking the Associate of Arts degree of Oxford, he adopted architecture as a profession, and soon showed a good grasp of practical requirements. He first came into prominence as the architect of numerous board schools erected soon after the passing of the Education Act of 1870. About twenty-four years ago he opened business in Truro. In Truro he came into prominence shortly after taking up residence in the city by gratuitously designing and superintending the erection of a series of triumphal arches and other decorations in honour of the visit of the then Prince of Wales in 1880 to lay the foundation-stone of the cathedral. In 1886 he entered the city council as one of the representatives of the Eastern Ward. On the formation of the Cornwall County Council fifteen years ago he offered his services to the electors of the Eastern Ward, and was elected without opposition. Membership of the governing bodies of the county and of Truro brought him into touch with all county and local movements, and his astounding energy was drawn upon in a variety of ways, but still he found time to carry on and develop a large practice which in itself would have proved sufficient for the strength of most men.

Previous to entering the County Council, Mr. Trevail studied local government closely both at home and abroad, and his knowledge of the subject was esteemed so highly that he was requested to be one of the deputation to the Right Hon. C. T. Ritchie, then President of the Local Government Board, to represent certain county requirements whilst the Local Government Act of 1888 was still under consideration by Parliament. The proposals he helped to put forward on that occasion became part of the measure.

As a member of Truro City Council Mr. Trevail insistently advocated financial and sanitary reform. In 1894-5 he was elected mayor of the city.

A few years ago Mr. Trevail was appointed architect of extensions at the County Asylum at Bodmin, and that necessitated his retirement from the County Council. But he continued a member of the City Council up to the time of his death, and attended a recent meeting, though during the past twelve months he had not shown anything like his wonted interest in the City Council affairs. The building operations at the County Asylum were going on under his direction, and of the work—which is estimated to cost about £100,000—only about £30,000 has been completed.

Though his practice as an architect was a wide and varied one, Mr. Trevail will be chiefly remembered by his board schools, free libraries, and technical schools, and the huge hotels along the coast line. But he also carried out in his native county and elsewhere many banks, churches, chapels, schools, mansions, and hospitals. Among his executed designs are:—The Devon and Cornwall Banks at Truro, Falmouth, and Newquay; the Cornish Banks at Helston, St. Columb, and Newquay; the Post-office at Truro; the large blocks of board schools at Fowey, Mervagissey, St. Ives, Padstow, and Oxford-street, Plymouth; the public libraries built for Mr. Passmore Edwards at Truro, Hayle, Camborne, Bodmin, and Launceston; the Passmore Edwards Library and Hospital at East Ham, Essex; public library and technical schools for Newton Abbot, Devon; and in Truro the block of buildings known as the Central Technical School for Cornwall, a perspective view of which found a place on the line in the Royal Academy Exhibition of 1898. In hotels, Mr. Trevail's best known works are the Pendennis, at Falmouth; the Carbis Bay, St. Ives; the Housel Bay, at the Lizard; the Atlantic and Headland Hotels, at Newquay; and the King Arthur's Castle Hotel, at Tintagel. The residence of Mr. Edward Hain, M.P., Treloyan, St. Ives, is one of Mr. Trevail's works, and he also planned the churches of Nappan

and Upton Cross. The Royal Institute of British Architects selected in 1878 works by Mr. Trevail to represent British architecture in the Paris Exhibition of that year, and for the Sydney and Melbourne Exhibitions of the two following years, and these works earned for him international medals and diplomas. In 1885 he joined the Society of Architects, and subsequently was elected a member of the Council. He was unanimously elected a vice-president in 1896, and after filling that office for four years in succession, was unanimously chosen president of the Society for 1901-2, and re-elected for 1902-3. Only about a fortnight ago he was succeeded in the presidency by Mr. W. W. Thomas, of Liverpool. He threw himself into the work of the Society with characteristic zeal, warmly supporting the movements for the registration of architects, and the amendment of the laws of ancient lights, while he lost no opportunity of urging the importance of widening the roadways, and setting a higher ideal in the architecture of London streets. During his two years of office the annual dinners of the Society were organised on a much larger scale than had previously been attempted, and Mr. Trevail invited a large number of influential and distinguished guests from among his friends and clients; the toast lists on each occasion were swelled to abnormal proportions, and he proved an autocrat in his demands for brevity in speeches and responses. Some ten years ago Mr. Trevail was elected a Fellow of the Royal Institute of British Architects, and at the annual meeting of that body in May last strenuously supported the principle of Architectural Registration. As a result he was nominated for a seat on the Council, but was defeated at the poll. For some years Mr. Trevail was the strenuous advocate for "the second line of railway into West Cornwall," doing all in his power to get the lines of the London and South Western Railway extended to the west of the Delectable Duchy. In the pursuit of this he in 1894 led a movement which procured the rejection by the House of Commons of what he described as a Bill destined to prevent the London and South Western Railway coming further west, although the Bill had passed the Committee stage, and was upon its third reading. For this and other services to the county he was the recipient at the hands of the Lord Lieutenant, the Earl of Mount Edgecombe, of a service of plate valued at 500 guineas, and subscribed to by upwards of four hundred persons in the county. Notwithstanding the many calls upon his time, Mr. Trevail travelled a good deal on the continents of Europe and America. He never married.

OBITUARY.

The death occurred on Friday at his residence, Cavendish-road, Birkenhead Park, of Mr. JAMES RHIND, a well-known architect, practising in Dale-street, Liverpool, whose illness had only been of six weeks' duration. Mr. Rhind went to Liverpool about 30 years ago, and before commencing business on his own account was in the office of Messrs. A. and W. Audsley, in that city. He was in his sixtieth year.

His death has occurred of Mr. EDWIN POVER, borough surveyor of Faversham. The deceased gentleman had held the appointment for about thirteen years. During his tenure of the post the corporation had undertaken several important works, including new sewerage, the laying out of a borough cemetery, and several street widenings, under the surveyor's superintendence. Mr. Pover held several other public appointments, and in addition had a considerable private practice. He was sixty years of age, and was a native of Faversham.

On Thursday in last week, at his residence, North High-street, Musselburgh, there died ex-Bailie WILLIAM STREPPLES, the senior representative of a firm of house painters and decorators, established for generations in the town. From 1833 to 1897 he was a member of Musselburgh Town Council, and successively served as councillor, police treasurer, town treasurer, and bailie. In 1896 he missed being provost of the burgh by a single vote. He had a connection with the volunteer movement of fifteen years' duration. In connection with numerous local societies he was a prominent official. Since he retired from the town council six years ago he had been in indifferent health. He was in his sixty-fourth year, a widower, and leaves a grown-up family.

PROFESSOR ROBERT H. THURSTON, the head of the Sibley College of Engineering at Cornell

University, died there very suddenly last week, on his 64th birthday. Professor Thurston was known through his books on the materials of engineering. He was a native of Providence, Rhode Island, and a graduate of Brown University. He served with distinction in the engineering corps of the army during the Civil War, and at the close of the war was appointed Professor in the Naval Academy. Shortly afterwards he was offered the charge of the engineering department of Stevens Institute, in Hoboken. In 1885, on the organisation of the Sibley College of Engineering, he was invited to become its head, and had remained there ever since.

CHIPS.

Upon the death, on Sunday, at the great age of 93 years, of Sir Charles Nicholson, M.P., first baronet, of Sydney, N.S.W., and of Totteridge, Herts., his son, Mr. Charles Archibald Nicholson, architect, succeeds to the title. The late Sir Charles was a member of the first Legislative Assembly of New South Wales, and three times held the office of Speaker of that Chamber. He was knighted in 1852, and his baronetcy dates from 1859. The foundation of the great University of Sydney, of which he was for many years Chancellor, was the work with which his name has been specially connected.

The approaching tercentenary of the birth of Rev. Robert Bathe, ejected Vicar of Rochdale, and founder of the congregation which now worships at Blackwater Street Unitarian Church in that town, is to be commemorated by a memorial marble tablet to be executed by Messrs. Harry Hems and Sons, of Exeter.

In Okehampton parish church on Sunday a carved oak screen, at the tower end, was dedicated by Canon Flint. The Rev. Medley Fulford, late A.R.I.B.A., prepared the design gratuitously.

At Kettering new refuse destructor works are in course of erection in Rockingham-road for the urban district council. The chimney in connection with the works has now been carried to its full height of 152ft.

The restoration of Polebrooke Church is in progress at a cost of £1,400. The chief work is the repair of the nave roof.

On Sunday, the vicar of Chorlton, Staffs, dedicated a new oak reredos and stained-glass window. The reredos (the work of Mr. R. J. Epley, of Eccleshall) and the window (by Messrs. Burlison and Grylls, of London) have been presented to the church by the vicar and his sister.

Mr. H. Ross Hooper, M.A., inspector of the Local Government Board, held an inquiry in the Weston-super-Mare town-hall on Wednesday week with reference to an application by the Weston-super-Mare Urban District Council for sanction to borrow £2,860 to repair storm damages to the Knightstone undertaking and the Marine Parade.

The Cross Keys Bridge, at Sutton, which carries the main road connecting Lincolnshire and Norfolk over the River Nene, was on Wednesday week declared free from tolls. The bridge, which belongs to the Midland and Great Northern Railways Joint Committee, was erected in 1894-97, at a cost of £80,000, and is a swing bridge, worked by hydraulic power, built on the cantilever principle. The freeing has cost £7,000.

At the Guildhall, Plymouth, on Tuesday next, the 17th inst., Messrs. E. Pearce Burd and H. Percy Boulnois, M.Inst.C.E., Local Government Board inspectors, will hold an inquiry into the application of the Plymouth Corporation for sanction to borrow sums amounting to £248,252, in respect to capital expenditure incurred for purposes of electric lighting, sewerage, street improvement, parks, labouring-class dwellings, and other works, £3,200 for repaving Sutton-road, and £6,700 for purposes of electric lighting.

At the parish church, Weston-super-Mare, on Sunday, the rector dedicated a stained-glass window which has been placed in the north aisle. The subject of the window is Christ and his Disciples, with children in the foreground.

The ceremony took place in Danfermline Abbey on Saturday afternoon of unveiling a memorial of non-commissioned officers and men from the city who fell in action or died during the South African campaign. The memorial takes the form of a moulded Norman arch, resting on columns, with moulded base and carved capitals. In the centre of this is placed a massive tablet of Sicilian marble on a base of the same material. In front of the base and carved out of the same block are representations of the feather bonnets of the Highland regiments, also the claymore and belts, and on the top of these is placed a wreath of laurel. The memorial, which is 11ft. 6in. in height, has been executed by Messrs. Stewart, MacGlashan, and Son, Edinburgh.

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ILLUSTRATIONS.

THE INDEMNITY MUTUAL MARINE INSURANCE OFFICES, OLD BROAD STREET, E.C.—SILVER MEDAL DESIGN FOR STAINED GLASS WINDOW.—PROPOSED UNITED METHODIST FREE CHURCH, SNEINTON.—CHILDREN'S CONVALESCENT HOME, ST. ANNE'S-ON-THE-SEA.—SECOND PRIZE DESIGN FOR LEEDS PUBLIC LIBRARY AND BATHS.—SELBY ABBEY.—DIEPPE CASTLE.—APPLETREETWICK.

Our Illustrations.

THE INDEMNITY MUTUAL MARINE INSURANCE COMPANY NEW OFFICES, OLD BROAD STREET, E.C.

This design, by Mr. Arthur C. Blomfield, M.A., shows an important corner block of buildings in course of erection at the corner of Threadneedle-street, with a frontage in Old Broad-street. The walls as shown were intended to be entirely in stone ashlar. The work is being carried out by Mr. Howard Chatfield Clarke, architect, this plan having been submitted in a limited competition.

DESIGN FOR A STAINED GLASS WINDOW: NATIONAL SILVER MEDAL DRAWING.

The legend of St. Nicholas, from which the subject for this stained-glass cartoon was taken, has this paragraph:—"During a dreadful famine in his country, St. Nicholas went about from town to town visiting and consoling his flock, and upon one occasion he took up his abode with a man who was accustomed during the scarcity to steal little children, and serve up their salted remains to his guests. He set such a dish before St. Nicholas, who at once perceived the crime, and, charging his host with it, went to the tub where the mutilated remains of the children were kept in brine, and, by making the sign of the cross over them, restored them to life." In the cartoon St. Nicholas is represented with the children restored; while the innkeeper is looking through the grating to the cellar, fascinated by curiosity, which for the moment overcomes his anger and terror at the saint's discovery. Miss Florence Camm is the designer of this window, and her cartoon reproduced to-day was one of a set for which a National Silver Medal was awarded this past summer.

UNITED METHODIST FREE CHURCH, SNEINTON, NOTTINGHAM.

This building will stand on a triangular site at the junction of Sneinton Boulevard and Thurgarton-street, Sneinton, in the City of Nottingham, and is planned to accommodate 550 persons—328 on the ground floor and 222 in the galleries. Externally the building is of local pressed bricks, with Derbyshire stone dressings, the roofs being covered with permanent green slates. The internal woodwork is of pitch-pine stained and varnished. The architect is Mr. W. H. Higginbottom, of Nottingham, whose design was selected in competition.

CHILDREN'S CONVALESCENT HOME, ST. ANNE'S ON SEA.

This home is for ten boys and ten girls, and with provision for further enlargement of five beds for each sex. It is to be fitted up on the latest principles. The materials are brick, with

stone dressings, red tile roof. The whole of the cost will be borne by Sir John O. S. Thursby, who is endowing it to be free of expense for always. The architect is Mr. Thomas Muirhead, of Manchester.

LEEDS PUBLIC LIBRARY AND BATHS: SECOND PRIZE DESIGN.

This drawing was exhibited at the Royal Academy this year by Mr. Percy Robinson, who won the second prize in the competition at Leeds a short time ago. We illustrated the selected design from last year's Royal Academy drawing in the BUILDING NEWS for May 9, 1902. Mr. H. Ascoug Chapman, A.R.I.B.A., being the architect.

SELBY ABBEY.

THE illustration of Selby Abbey is from a sketch of the south aisle of the choir. The abbey was founded in 1069 by Benedict, the nave alone being of Norman architecture. The rest of the building is a remarkably fine example of the Early and Late periods of Decorated architecture. The choir, in particular, is noted for its beauty and wealth of detail, and among other portions may be mentioned the fine sedilia and altar screen, and the arcading around the aisles. The abbey was suppressed at the Reformation in 1540.

DIEPPE CASTLE.

DIEPPE CASTLE occupies a picturesque position to the west of the town on the side of the hill. It was erected in 1435, and is a good example of a mediæval fortress with its machicolations and deep fosse around one side. It was besieged several times by the English, and was taken by them in the year 1694, after a strenuous resistance. It is now used as an infantry barracks and the interior is only visible by special permit.

APPLETREETWICK.

THE picturesque old building at Appletreewick in Wharfedale, shown in sketch, was formerly a chapel of ease used by the monks of Bolton Priory, which is about six miles distant. It has long been in a state of decay, and is now used as an outhouse. The adjoining building is called Low Hall, and is used as a day school. These two sketches are by Mr. Edward L. Gaunt.

The parish church of Fotheringay is about to be restored from plans by Mr. Temple Moore. The entire scheme is estimated to cost £7,000; but the section now to be undertaken will involve an outlay of about £1,600.

A stained-glass memorial window is being placed in the parish church of Penkridge. The subject of the window, which has eight panels, is "The Parable of the Sower," and it is the work of Mr. J. A. Dix, of Berners-street, London.

Sir Henry Hibbert, chairman of the Lancashire County Education Committee, opened a new "provided" school at Hazlehurst, Ramsbottom, on Saturday. The school has been erected, at a cost of about £7,000, to accommodate 368 scholars.

The portal-stone of the new Benson Hall in connection with the United Methodist Free Church at Whitley Bay was laid on Friday. Messrs. Mould and Tasker are the architects, and Mr. A. W. Stayer the contractor. The U.M.F. church itself, it will be remembered, was destroyed by fire a few weeks ago, and will also be rebuilt.

The will of Mr. Deputy John Greenwood, builder, of 10, Arthur-street West, and Highfield, Catford, has been proved, the value of the estate being £114,046 9s. 2d. The testator nominates his son, John Francis, to be the chairman of the directors of Greenwood and Co., Limited, and gives to Mr. W. G. Sheldon, Mr. James Hayes, Mr. Philip Henry Wyon, Mr. Josiah W. Stone, Mr. Percival Spencer, Mr. Stewart Greenwood, Mr. Sidney Hammond, Mr. Matthew Smith, Mr. Thomas Black, &c., the beneficial interests in various management shares during such times as they remain in the service of the company.

Under the auspices of the Institute of Builders a lecture on "A Comparison of English and American Methods in the Erection of Buildings" will be given by Mr. Charles Heathcote, F.R.I.B.A., of Manchester, at the Society of Arts' Hall, John-street, Adelphi, on Tuesday, Dec. 1.

At a mass meeting of the Penrhyn quarrymen at Bethesda on Saturday night, it was resolved to declare the strike ended. The figures were:—For discontinuing, 192; for continuing the struggle, 161. The men returned to work in the quarries on Monday, and thus the struggle is finally ended, after being stubbornly maintained for over three years.

COMPETITIONS.

BLACKPOOL.—The Fylde Water Board recently invited competitive designs for new offices to be erected at the corner of Sefton-street and Dixon-street, Blackpool, and on Wednesday week they met and adjudicated upon those submitted. The competition was limited to architects having offices within the Fylde Water Board area, and fifteen designs were sent in. After consideration the first prize was awarded the plans forwarded by Messrs. H. and W. Wade, 27, Birley-street, Blackpool, and St. Annes, under the motto of "Fair Trade." The total cost is estimated at £7,500, and the entrance is so arranged that it will be opposite Church-street, so that the clock-tower which will adorn the front will be seen from Church-street along Temple-street. It will be a three-story building, with a basement, and built of brick and yellow-stone facings. The accommodation will include—on the ground-floor, chief and assistant collectors', engineer's, drawing, and outside manager's offices, and show-room; on the first floor there is the board-room to the front, with an ante-room, offices for the clerk, superintendent and accountant, and accountant's clerk's, together with the telephone and typewriting rooms.

MEMORIAL WINDOW FOR DUNFERMLINE ABBEY.

—Sir Rowand Anderson, Edinburgh, who was appointed adjudicator on the eighteen designs sent in for competition for the McLaren memorial window to be placed in Dunfermline Abbey Church at the back of the pulpit, has made his award as follows:—(1) Messrs. Ballantyne and Gardner, Edinburgh; (2) Messrs. Stephen Adam and Son, Glasgow; (3) Messrs. Heaton, Butler, and Bayne, London; (4) Mr. C. R. J. Evans, London. The design of Messrs. Ballantyne and Gardner, which will be adopted by the trustees, includes two pictures. In the upper section is shown the empty tomb, illustrating the angelic message, "He is not here, He is risen." In the lower is a representation of the Lord's Supper.

CHIPS.

The Grand Duke Michael unveiled at Newcastle-under-Lyme, on Friday, a statue of Queen Victoria, a Coronation gift to the town by Sir Alfred Haslam, M.P., in his dual capacity as Parliamentary representative and mayor of the borough. The statue in bronze is a replica of the well-known one by the late Mr. Birch erected on the Victoria Embankment near Blackfriars Bridge. It is erected on a pedestal of granite 9ft. high, and has been put up in a prominent position on which six thoroughfares converge.

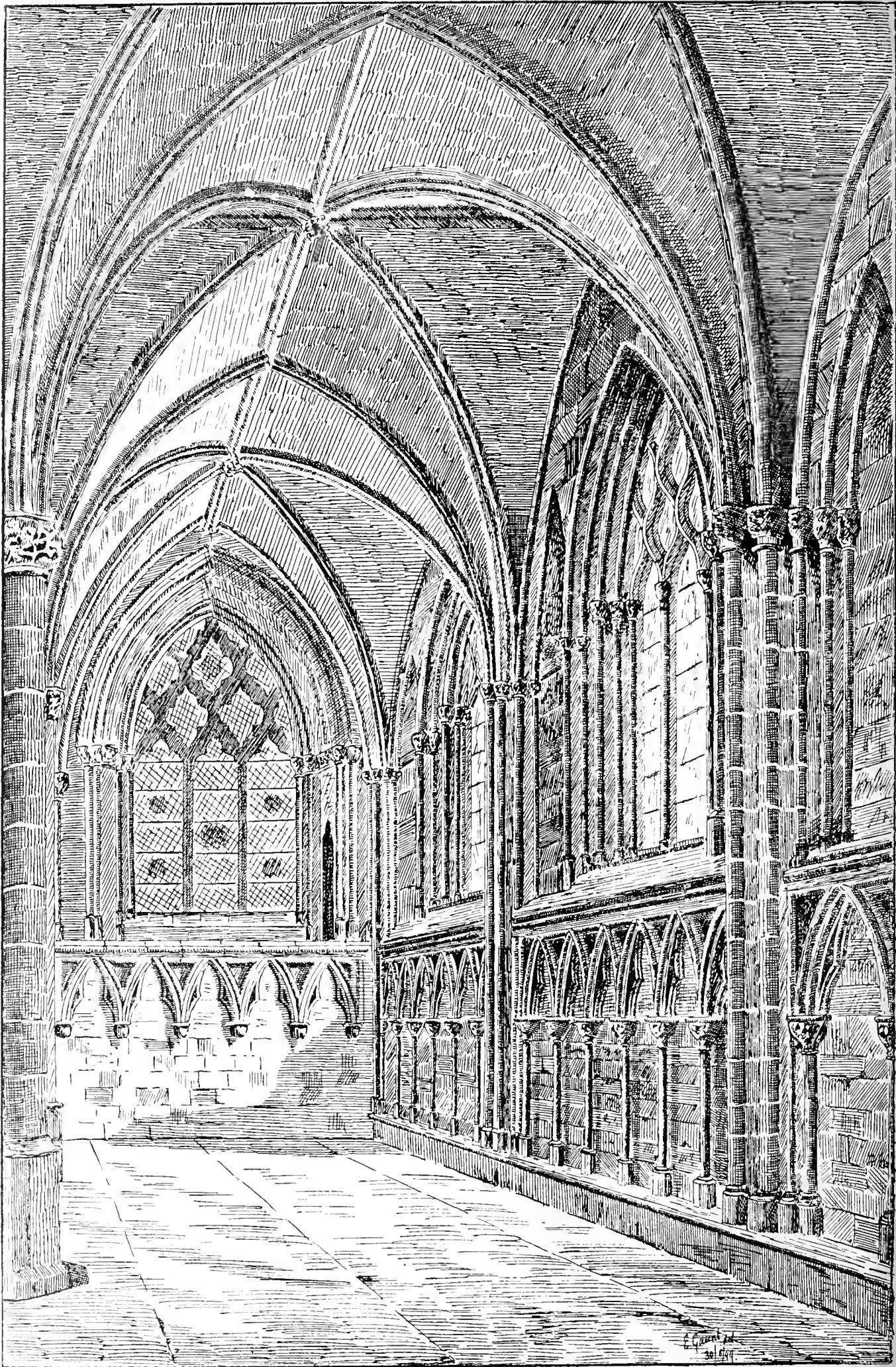
The urban district council of Skipton have decided to promote a Bill in Parliament next session for an Act authorising the utilisation of the Embasy stream and the construction of a reservoir near Embasy Moor, and with power to supply with water not only the township of Skipton, but the townships of Embasy-with-Eastby, Steeton-with-Thorlby, and Carleton. The engineer is Mr. G. H. Hill, of Manchester.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made by them for the construction of light railways in the county of Essex, from Southend by way of Rochford, Creeksea, Burnham, Southminster, Asheldham, Dengie, Tillingham, Bradwell-juxta-Mare, and West Mersea, to Colchester, including ferries and piers or jetties at Creeksea, Bradwell, and West Mersea.

Memorial stones have been laid of a new Wesleyan church now in course of erection at the corner of Harnett-road and Wimpole-lane, Colchester. The building, which is Gothic in style and will have a spire, is of red brick and stone. Messrs. Dobson and Son are the builders, and Messrs. Goodey and Cressall are the architects. It will provide seats for 500 persons, whilst the schoolroom will accommodate 250. The estimated cost of both buildings is £5,000.

The Hon. Mrs. Meynell Ingram has contributed £30,000 towards the cost of a new church and vicarage at Holbeck, Leeds. The Church Extension Society of Leeds have promised £3,000. Lord Halifax on Saturday laid the corner-stone of the building, which is to be erected from the plans of Mr. G. F. Bodley, R.A., and is to be dedicated to St. Edward the King. It will seat 750 persons. Mr. Bodley is also the architect of the adjoining church school; while Mr. H. Chorley, of Leeds, is the architect of the vicarage.

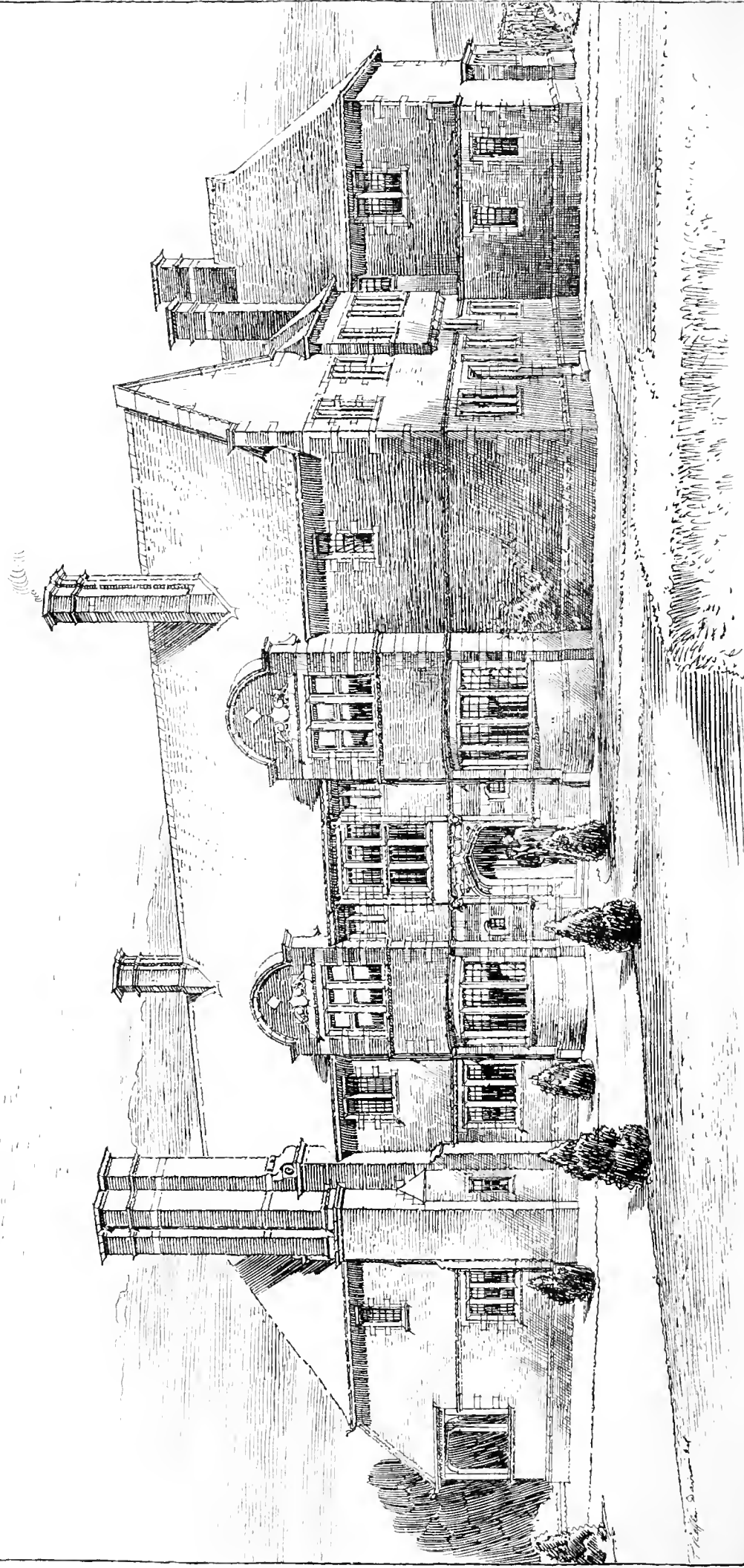
The London Water Arbitration Court on Saturday heard further evidence from accountants and others as to the proper method of estimating the revenue of the East London Water Company, and the case as regards this company was completed. The Court adjourned till Monday next.



SELBY ABBEY.—SOUTH AISLE OF CHOIR.

THE BUILDING NEWS, NOV. 13, 1903.

FOR SIR JOHN. O. S. THURSDY DART.



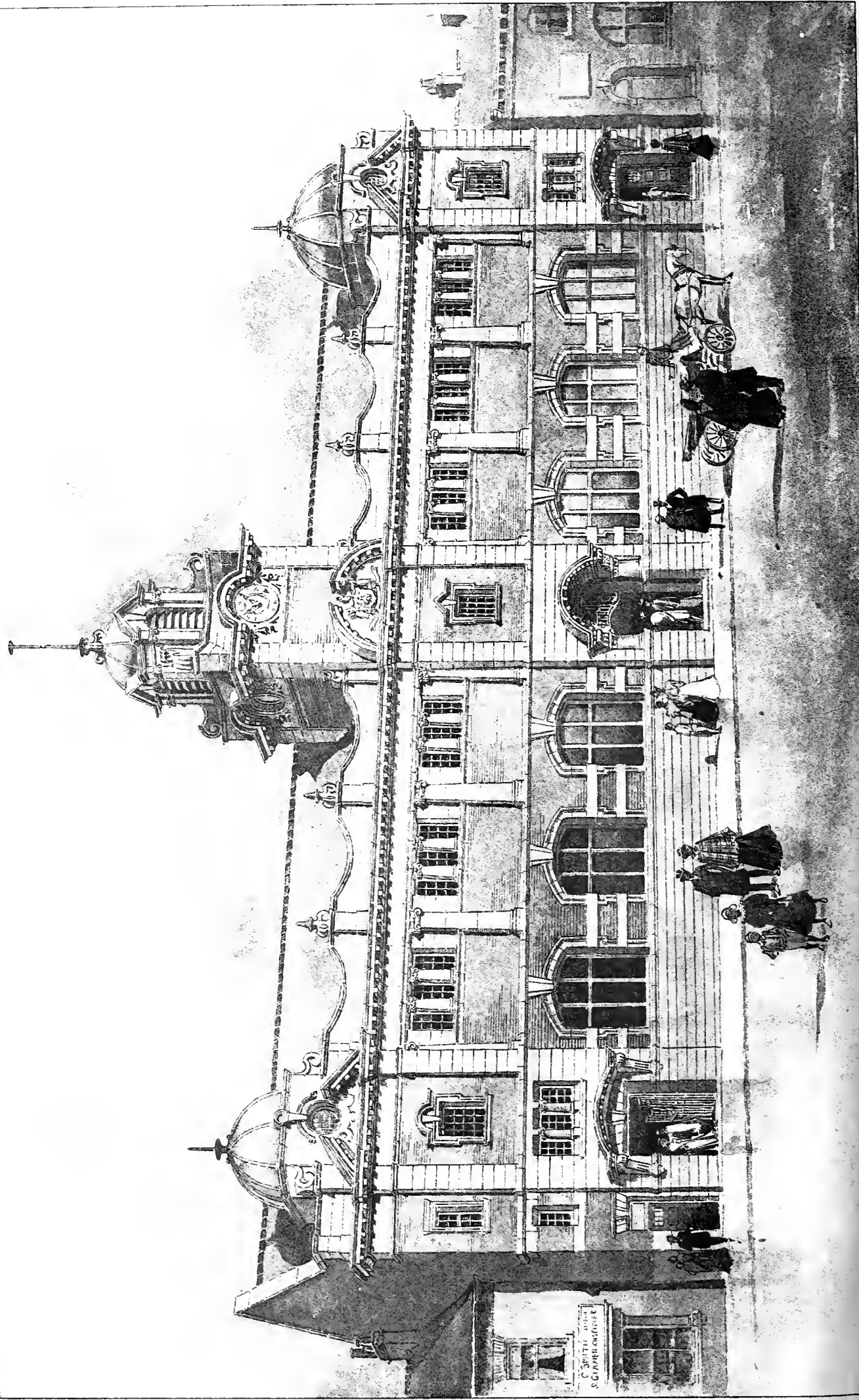
CHILDREN'S CONVALESCENT HOME.

ST. ANNE'S ON THE SEA.

THOMAS MUIRHEAD, ARCHT.
MANCHESTER.



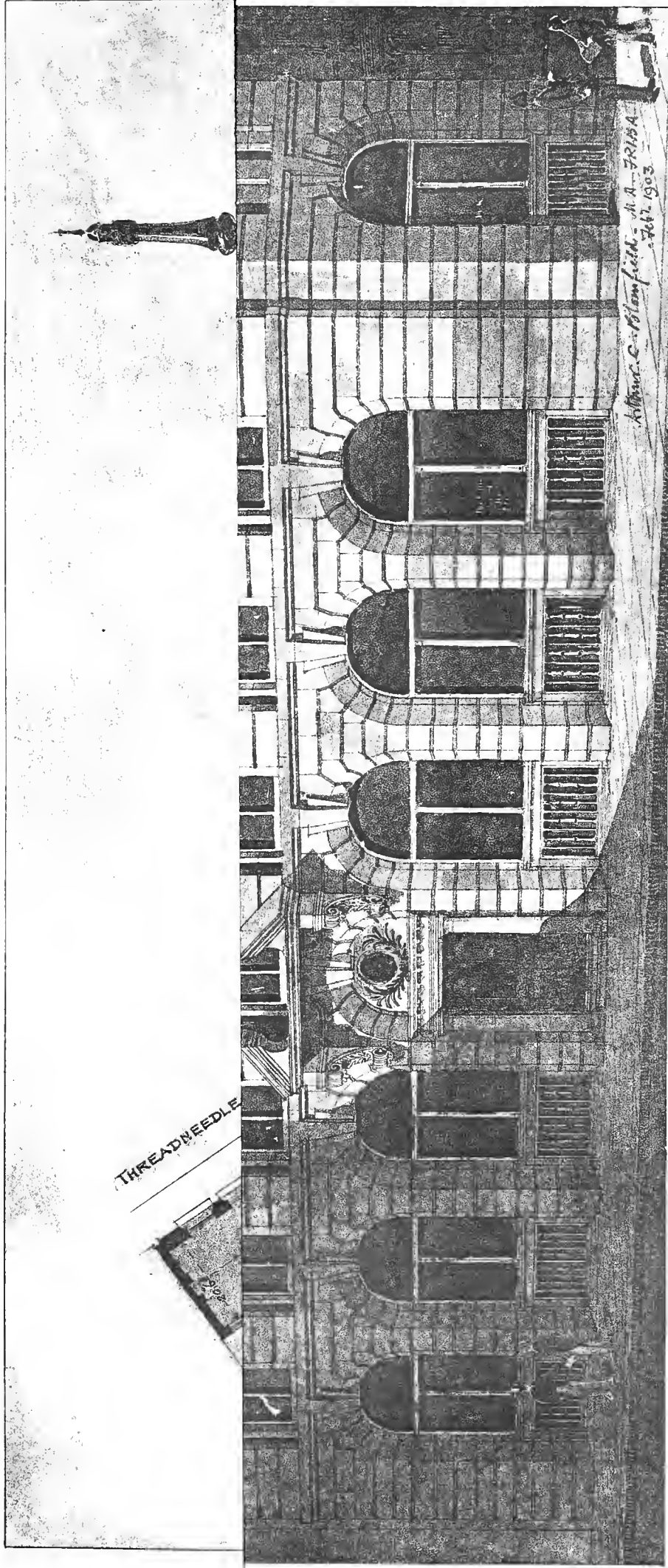
THE BUILDING JEWES, NOV. 13, 1903.



"PHOTO-TYPE" by James McKean, 8 Queen Square, London, W.C.

JEWES PUBLIC LIBRARY AND BATHS. SECOND DRAUGHTED DESIGN.
FENTON, NODDING & CO. ARCHT.

THE BUILDING PEWS NOV. 13, 1903.

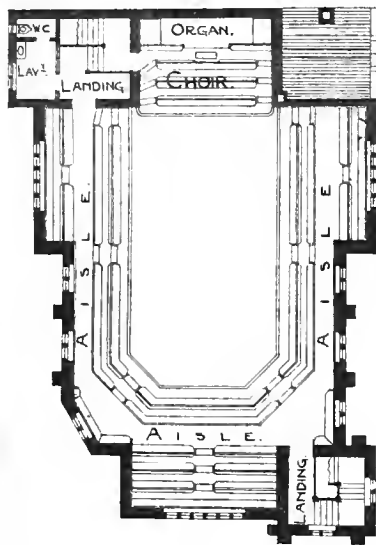


ARTHUR C. BLOWFIELD M.A. ARCHT

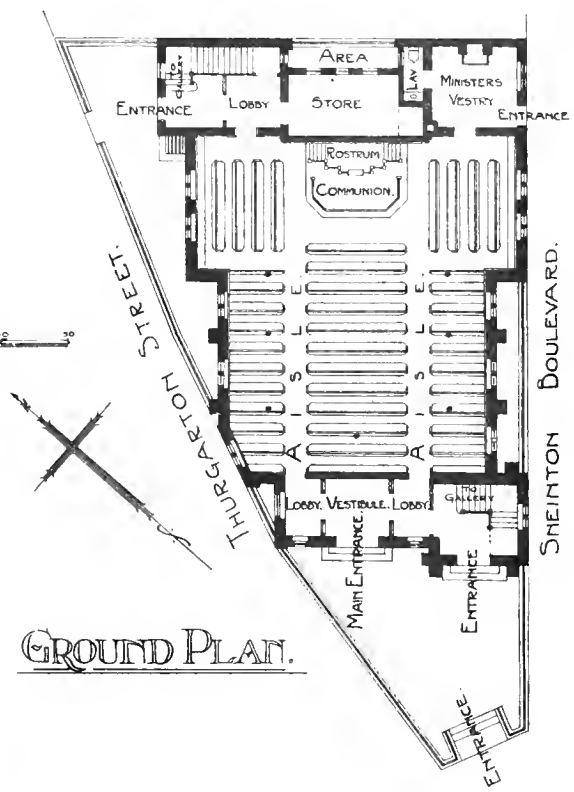
PROPOSED INSURANCE OFFICES. OLD BROAD STREET, CITY.

PHOTO TINT by JANE AKTIAN - QUEEN SQUARE LONDON W

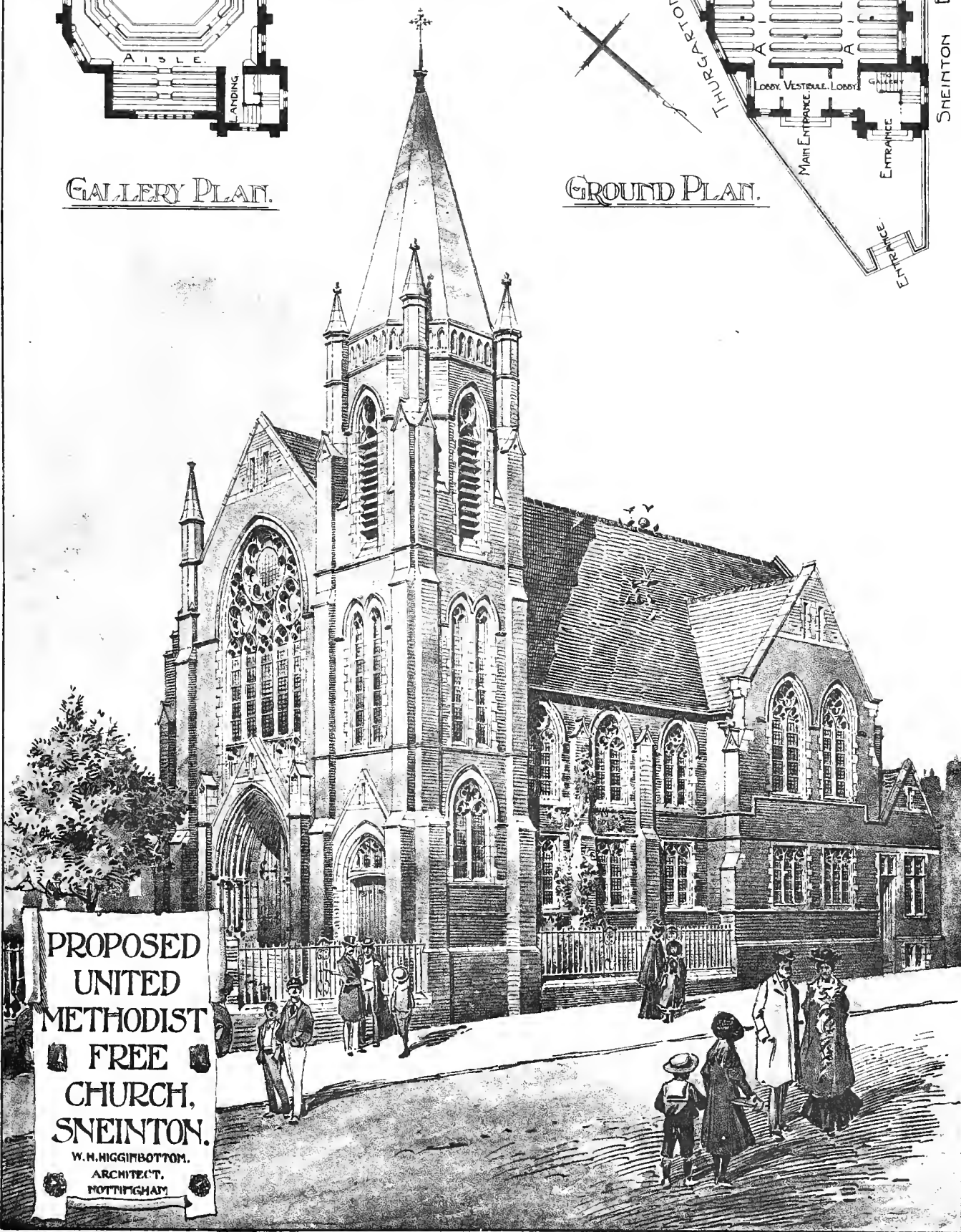
SELECTED DESIGN.



GALLERY PLAN.



GROUND PLAN.



FOR SIR JOHN. O. S. THURSDY DART.



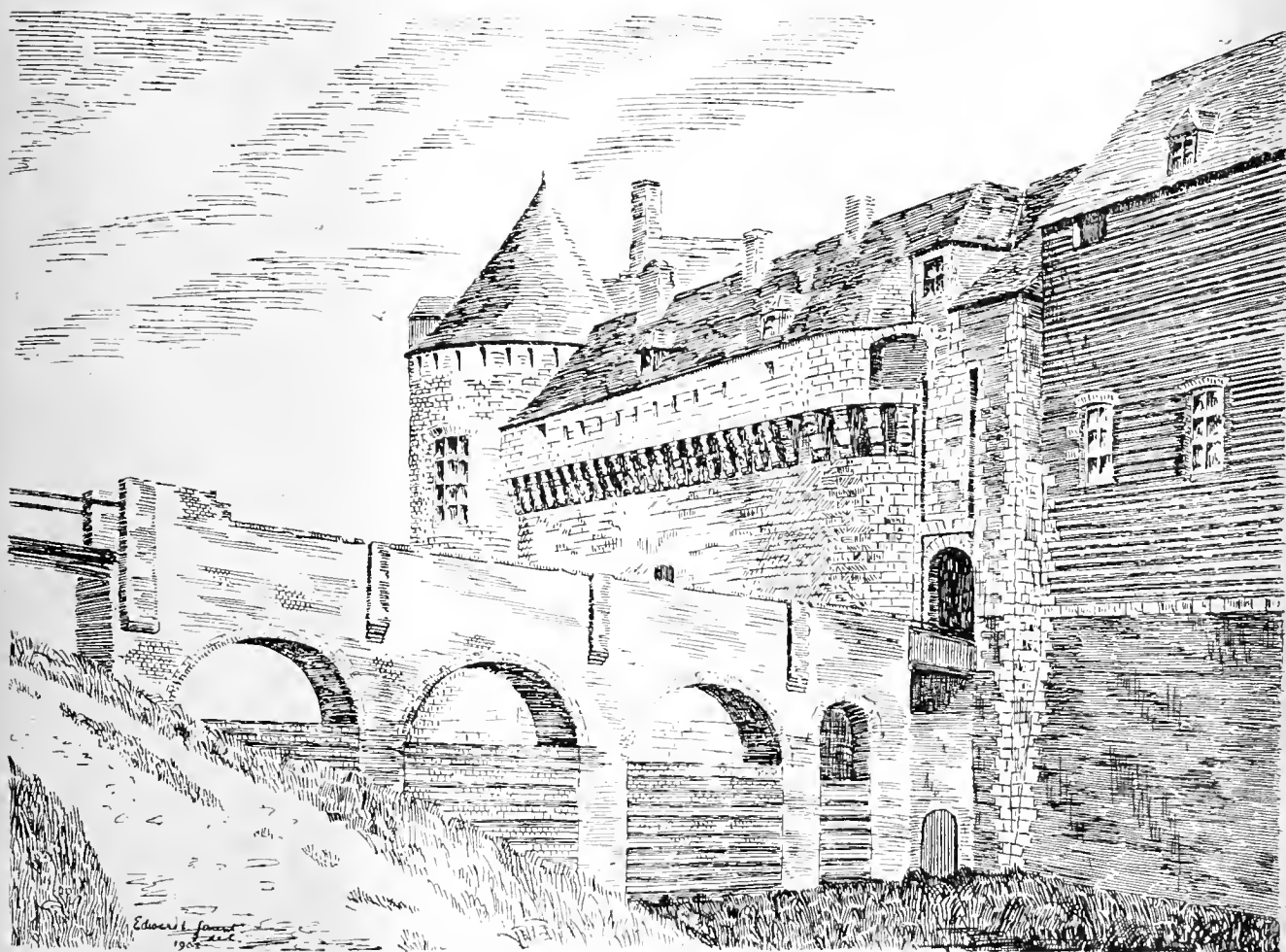
CHILDRENS CONVALESCENT HOME. ST. ANNES ON THE SEA.

THOMAS MURHEAD, ARCHT.
MANCHESTER.





OLD HOUSE APPLETON YORKS.



DIEPPE CASTLE

Engineering Notes.

BERWICK.—At the last meeting of the town council the condition of Berwick Old Bridge was discussed. The borough surveyor reported that he had discovered, while a new footpath was being laid, a cavity behind the spandrel of one of the arches, causing the spandrel to bulge outwards. The same external conditions were visible at other arches. Mr. James Stevenson, architect, who had been called in to examine the bridge, reported that the parapet walls on the west side, which were 12in. thick, had no proper footings, these having been broken or worn away to a thickness of only about 3in., and part of the parapet walls were in a dangerous condition, and might give way at any time with serious consequences. The main structure of the bridge, piers, and arches, however, was safe. He recommended the taking down of the parapet walls and their rebuilding as at present after the footings had been put right. A long discussion ensued, it being suggested that the present stone parapet should be replaced by a lighter iron trellis. Mr. Stevenson said by his scheme the old character of the bridge would be preserved, and he thought anyone with an understanding of that relic of the past, and the vandalism that suggestion would mean, would do what they could to preserve the character of the bridge. It was finally resolved that the services of an efficient bridge engineer be called in to examine the bridge, the works committee being empowered to carry out any repairs suggested.

SOUTHAMPTON.—The work of providing increased quay and dry-docking accommodation at Southampton Docks is in active progress for the London and South-Western Railway Company. The land on which the new graving-dock is being built, with its pump-house and all the other appurtenances, was originally part of an extensive mudbank on the shore of the Test, which was covered by every high tide. To reclaim the land a chalk bank was tipped round it, the chalk being taken from the company's cutting at Micheldever. The surface of the chalk bank was then pitched with stone, and measures were taken to render it watertight, and as soon as it was sufficiently sealed to keep the water out, a centrifugal pump was installed in the inclosure to dry the reclaimed land. When the land was dry, excavations by hand gangs, steam crane, and steam-navvy commenced, the earth being utilised towards the re-filling and reclamation of other mudlands on the Dock Estate. The permanent dock walls are 22½ ft. thick at the base, diminishing to 3 ft. at the coping level, while the floor is 16 ft. thick at the middle of the dock. The floor is reached by eight flights of steps, and the dock is provided with a travelling electric crane capable of lifting 50 tons at 80 ft. radius. The entrance gates, which are being constructed by Messrs. Head, Wrightson, and Co., of Teesdale, will have a span of 90 ft., and are constructed of steel. The pump-house will contain two centrifugal pumps capable of emptying 85,000 tons of water in 2½ hours. Alongside the pump-house is a boiler-house. The dock will be 860 ft. long (and can be lengthened if necessary), 90 ft. wide at the entrance, and 120 ft. wide at the level of the coping. It will give a total depth of 29 ft. 6 in. neap tides, to 33 ft. spring tides at high water. The portion of the docks constructed in 1875 is also being extended and deepened from the present depth of 20 ft. to 30 ft. It has been decided to construct the platform of ferro-concrete on the Hennebique system. The work has been carried out in three sections, the first of which was completed in August, while good progress is being made with the second. Designs have been prepared, and the work commenced, for a new electric power station, from which will be supplied the current to electrically light the whole of the Docks. This is being erected on reclaimed land near the new graving dock. The engineer for the new work is Mr. W. R. Galbraith, M.Inst.C.E., and the resident engineer is Mr. F. E. Wentworth Shields, Assoc.M.Inst.C.E. The contractors for the work are Messrs. John Aird and Co., whose representative is Mr. J. W. Londrey.

WESTON-SUPER-MARE.—The commemorative pile of the new pier promoted by the Grand Pier Company at Weston-super-Mare was driven on Saturday. The new pier starts immediately opposite the end of Regent-street. The cost is estimated at £30,000. The total length will be

6,600 ft. by 45 ft. wide, increasing in width when the pavilion will be erected to 160 ft. The weight of cast-iron and steel work required is nearly 4,000 tons, and 600 screw piles will be used. The pavilion is to be of steel and wood, with four corner turrets and central dome, the dimensions being 150 ft. by 90 ft. wide. The main hall, 85 ft. by 70 ft., is arranged to seat 2,000 persons, with a stage 62 ft. by 23 ft. The entrance-hall is 42 ft. by 28 ft., and the ground floor refreshment-room is 33 ft. by 22 ft. An electric tramway will run the entire length of the pier. The pier itself is to be lighted by electric arc lamps. The landing-stage will accommodate two vessels at one time alongside, and at any state of the tide. The first portion of the pier and pavilion is to be opened in June, 1904.

PROFESSIONAL AND TRADE SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual business meeting of the Leeds and Yorkshire Architectural Society was held at the society's premises, Park-street, Leeds, on Monday, Mr. Butler Wilson, F.R.I.B.A., presiding. The chairman stated that the opening meeting of the new session would be held on the 19th inst., when the lady friends of members would be welcomed. The hon. secretary, Mr. H. S. Chorley, presented the annual report, which stated that the aggregate membership of the society was 141, being made up of 36 honorary members, 61 members, and 44 associates, the total membership being an increase of four on the previous year. The report mentioned with satisfaction that the new school of architecture, established under the auspices of the society, though still in its infancy, was an accomplished fact, and a full course of instruction was provided for the associates of the society in all subjects required for the preliminary and intermediate R.I.B.A. examinations. The competition among the associates for the prizes offered by the society was keener and more enthusiastic than in the intermediate previous years, and the work submitted was judged to be of a better and more even quality than had been the case in the three previous years. The silver medal and prize of five guineas given by the president for the best measured drawing of any ecclesiastical or domestic building erected anterior to 1800 A.D. was awarded to Mr. Martin Shaw Briggs, for measured drawings of Swinsty Hall, Yorkshire. A special prize of three guineas was awarded to Mr. P. A. Horrocks, for measured drawings of Hall's the Wood, Bolton; the prize of three guineas for the best design of an entrance-lodge and gateway, to Mr. Ralph Thorp; the prize of two guineas for the best essay on "Modern Street Facades in Leeds" to Mr. Martin Shaw Briggs; and the sketching prize of three guineas to Mr. J. C. Procter. No further steps had been taken, it was reported, to create a chair of architecture at the Yorkshire College. Mention was made in the report of the council's active interest in the proposed laying-out of Victoria-square, and also in the improvement of City-square. In regard to the former, it is pointed out that the first essential is the enlargement of the square on its southern side, the present area being totally inadequate. In regard to City-square, the president formed one of a deputation from the Society to the improvements committee, and asked that a new frontage line at the south-west corner between Wellington-street and Quebec-street should be adopted, and also that the building to be erected on the vacant ground should harmonise, and as far as possible correspond in outline and skyline with the Standard Assurance buildings. It was satisfactory to record that these suggestions had been adopted. The council expressed their gratitude for the valuable collection of architectural works bequeathed to the Society by the late Mr. E. Birchall, and notified that steps were being taken to deposit the Society's library with the City Library authorities for better security and supervision. The report was adopted on the motion of Mr. G. F. Bowman, seconded by Mr. R. P. Oglesby. Mr. W. H. Thorp (hon. treasurer) read the statement of accounts, which showed a balance in hand at the end of the financial year of £95 5s. 2d., as compared with £96 8s. 1d. the previous year. The balance-sheet was adopted on the motion of Mr. H. Perkin.

THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.—A general meeting of the members of the Royal Institute of the Architects of Ireland was held at 20, Lincoln-place, on Thursday,

Nov. 6, at 4 o'clock p.m., Mr. G. C. Ashlin, President, in the chair. Also present, Messrs. J. Kelly Freeman, R. Caulfield Orpen, C. A. Owen, Joseph A. Geoghegan, J. Charles Wilmot, James H. Webb, J. Rawson Carroll, Edwin Bradbury, W. Kaye Parry, Geo. P. Sheridan, and W. M. Mitchell. The ballot papers for the election of Honorary Secretary and Honorary Treasurer were examined, and the President announced that Mr. R. Caulfield Orpen had been elected Honorary Secretary and Mr. Charles Ashworth Honorary Treasurer of the Institute for the ensuing three years. Mr. J. Rawson Carroll moved and Mr. William Mitchell seconded the following resolution, which was carried unanimously: "That the Institute at its general meeting take the opportunity of placing on record its hearty appreciation of the indefatigable energy and tactful skill which Mr. Kaye Parry has displayed in carrying out the duties of Honorary Secretary of the Royal Institute of the Architects of Ireland during his term of office." A cordial vote of thanks to the outgoing Honorary Treasurer, Mr. C. A. Owen, was moved by Mr. W. Kaye Parry, seconded by Mr. R. Caulfield Orpen, and carried unanimously.

CHIPS.

Among the Birthday honours announced on Monday is a knighthood for Mr. Charles Holroyd, Keeper of the Tate Gallery, and a well-known etcher and water-colour artist; Col. Dunlan A. Johnston, R.E., director-general of the Ordnance Survey, receives a Companionship of the Bath; and Mr. Louis Philippe Hébert, a Canadian artist and sculptor, receives a C.M.G. The Imperial Service Order is conferred on Mr. Cecil Wat Darby, engineer-in-chief for Public Works, New South Wales; and on Mr. David Ewart, chief architect to a Canadian Department of Public Works.

Hans Beham's famous fountain at Nuremberg, originally erected between 1385 and 1396, has just been undergoing restoration, and is now resplendent in gilding, red and blue paint. A great part of the work has been to obliterate the alterations made in 1587 and in 1821. The four lions at the angles have been removed, to be replaced by statues of the Four Evangelists.

The war memorial erected in Chester-le-Street cemetery by public subscription was unveiled on Friday by Lord Chesham. The monument is in the form of an obelisk standing 15 ft. 9 in. high, and is of Shap Fell granite throughout. On three of the four sides the name of some principal scene of action in the late war is cut in relief round the base of the pedestal. The fourth side contains the name South Africa.

The new All Saints' Church at Elland, near Leeds, was dedicated on Friday. The church has not yet assumed the dimensions of the original scheme, which was to cost £15,000. The building has been erected on a site given by Lord Savile, and consists of the eastern section of the church, including chancel, transept, morning chapel, and bays of nave. This portion seats 450 worshippers, has cost £11,500, and is Early English in style. The roof is waggon-vaulted.

The Great Western Railway Company have decided to erect at Westbury Station an engine-shed, giving accommodation for forty locomotives, to serve the new line from London to the West, on completion of the Castle Cary-Langport branch, which is now under construction.

A new school which has recently been erected by the London School Board in Kingsgate-road, Hampstead, at a cost of over £17,700, and which provides accommodation for 452 boys and girls, was opened on Monday.

The foundation-stone of a new church at Broadheath, in the parish of Hallow, near Worcester, was laid on Friday. The building has been designed by Mr. C. Ford Whitcombe, and is estimated to cost £3,050. Towards this sum £2,500 has already been raised. The church will consist of a nave, chancel, western tower, and an ambulatory on the south side, which will afford means for extension. Seating accommodation will be afforded for 210 people.

At a meeting of St. Annes-on-Sea Urban District Council it has been decided to adopt the Free Libraries Act. St. Annes, it was stated, has prospered more than any other town in the North of England, and at no distant date there will be a museum and a technical school. The council are promoting a competition among local architects for the best design for the Carnegie Library, the inclusive cost of which is not to exceed £3,500.

A memorial to the late Sir Frederick Perkins, J.P., was dedicated on Sunday at St. Peter's Church, Southampton. The memorial, which is the gift of Lady Perkins, consists of carved oak choir-stalls, executed by Messrs. Sinclair and Clements, of Oxford-circus, London.

Building Intelligence.

Bristol.—A branch police and fire-station is being erected for the Bristol Corporation at Horfield, on a piece of ground formerly used as a nursery at the corner of North-road and Somerville-road. The station will have a Classic front of Cattybrook bricks and freestone dressings. On the ground floor will be the inspector's office, and in the rear the charge room. The cell accommodation will be for one female and three males. Towards the corner are the fire-station and engine-house, and adjoining are a two-stall stable, a fodder store, and general store. Quarters are provided over the police and fire-station for one married and one single policeman. The buildings will be warmed by a low pressure hot-water system. The contract for building has been let to Messrs. R. Wilkins and Son, of Bristol, at £4,437.

Ranworth, Norfolk.—The nave of the parish church of St. Helen Ranworth, was reopened on Thursday in last week by the Bishop of Norwich, after having been closed for repair for about four years. A new roof has been erected over the nave, and the tower and walls made structurally sound, while the famous screen has been repaired. The old pulpit has been restored, and the ancient benches replaced with an oak block floor beneath them. Mr. J. T. Micklethwaite, F.S.A., was the architect, and Messrs. Cornish and Gaymer, of North Walsham, were the builders. The total outlay has been £3,100.

Embleton.—At the Northumberland village of Embleton, last week, the new club-rooms and village hall, erected as a memorial to the late Dr. Mandell Creighton, Bishop of London, were formally opened. The building is constructed of local basalt "whinstone," with Accrington red brick facings and rough-cast gables. The west portion of the structure provides for separate clubs for men and women, having billiard-room, reading-rooms, library, and four rooms upstairs for caretaker. On the east of the club rooms is the large hall, 65ft. by 27ft., with stage 15ft. by 27ft., under which is a store for tables and stage apparatus. The work has been carried out by Messrs. Elliot Bros., contractors, Preston, from the plans of Mr. J. Wightman Douglas, architect, Alnwick and Newcastle, whose designs were selected in competition.

Edgaston.—The new reredos which has been erected at a cost of over £700 in St. George's Church was recently dedicated. The reredos, which is of oak, and covers the whole of the east wall of the chancel below the window, is divided into five parts, the centre being higher than the sides. The top is 20ft. above the altar steps. There are a number of niches with canopies, and it is to be hoped that all will in due time be filled with figures. In the centre niche has been placed a carved figure of our Lord in the act of blessing. The side niches and canopies will contain figures of the four evangelists, two of which have already been given. The lower portion of the reredos is filled in with tracery in panels, while a moulding about a foot wide, decorated with shields and vine leaves, runs on the two sides and top of the centre portion. The reredos is the work of Mr. Bridgeman, of Lichfield, who has executed all the other carving in the church, and is from designs by Mr. J. A. Chatwin, architect, of Birmingham.

London County Council.—At Tuesday's meeting of this body, approval was given, after some discussion, to a report of the Fire Brigade Committee to purchase sites in Queen Victoria-street and Cannon-street, on which to erect a station in substitution of the present station in Watling-street, and also to build new fire stations at Knightsbridge and Shooter's Hill. The Main Drainage Committee recommended that the expenditure of £291,000 should be sanctioned in respect to the construction of a second section of the proposed new sewers between the Crossness outfall and the Plumstead railway station, and that the work should be carried out without the intervention of a contractor, and that the drawings, specifications, and estimate should be referred to the Works Committee for that purpose. After the rejection of an amendment to refer the matter back to the committee with a view of inviting tenders for the work, the recommendation was adopted. The Parks Committee reported that satisfactory progress is being made with the acquisition of the various properties required for the Hainault Forest scheme. Mr. E. North

Buxton had been actively employed on the work of reforesting the farmed land, the result of which would be very apparent by the time the land is thrown open for public use. It was agreed to lend the Westminster City Council £63,000 for the erection of working-class dwellings at Regency-street, to be repaid in sixty years.

Liverpool Cathedral.—At a meeting of the executive committee of the Liverpool Cathedral scheme, on Tuesday, Mr. George Bradbury (consulting surveyor) reported that the demolition of houses on St. James's Mount had been begun preparatory to the laying of the foundations of the cathedral. The committee decided to proceed, in the first instance, with the main fabric of the building, including the choir and the cross of the transepts. This part of the building will accommodate a congregation of 3,500, and the cost will approximate to £240,000. It was further announced that the superficial area to be occupied by the cathedral when completed will exceed that of any similar building in Great Britain. Since the meeting, Earl Derby, as chairman of the committee, has received a letter from Lord Knollys, intimating that the King recognises the importance of the work of building a cathedral for the diocese of Liverpool, and that it will afford his Majesty much pleasure to give every consideration to the request which had been made to him that he should lay the foundation-stone early next year.

Newcastle-on-Tyne.—A visit of inspection was paid on Friday to the new infirmary buildings in course of erection on the Leazes by the building committee and subscribers, who were conducted over the works by Mr. Henry Cockrell, the clerk of works. The new infirmary, which occupies a site of ten acres, given by the corporation, will provide accommodation for 420 patients, as compared with 270 in the existing institution. The buildings are on the pavilion system, designed by Mr. H. Percy Adams, of London, and Mr. W. Lister Newcombe, of Newcastle. All the pavilions and the other buildings are parallel, and they occupy almost every yard of the site, running close to the boundary-walls. The nurses' home faces the Jubilee gates at the Leazes Park. Immediately behind it is one short pavilion, and then behind that are two pavilions in one long block. Behind that comes the administrative block, facing the Spital Tongues-road, and at the rear of that are two short pavilions. Another block contains two pavilions, and, skirting the roadway, is the last long block, comprising out-patients' department, children's wards, and boiler house. The accessory buildings include mortuary, laundry, and lodges. A main corridor runs along the whole length of the building, giving access to each ward. The surgical wards are all placed on the ground floor, where the operating-theatres are, and the medical wards are on the upper floor, all the pavilions being of two stories, except that at the lower end of the slope, where three stories have been built. The nurses' home has been accelerated, and it will be ready for occupation in June next. It is of freestone and red brick, and contains 105 bedrooms, besides sitting-rooms and other apartments. The home will be joined to the pavilion behind it (No. 3) by a conservatory.

St. Bartholomew's Hospital.—The Governors of St. Bartholomew's Hospital, at a court held on Thursday in last week, finally decided to rebuild the hospital on its present site, with certain extensions. It was agreed that, in the general scheme of rebuilding, provision be made for additional operating theatres; new casualty and out-patient departments; new nurses' home; new quarters for the resident medical and surgical staff; an isolation block and other new ward blocks to supply the place of those to be demolished; new mortuary, post-mortem rooms, and pathological department; internal structural rearrangement of the east, west, and south wings of the hospital. The house committee, with power to add to their number, are requested to determine, after consultation with the medical staff, by which of the several plans submitted by the architects, subject to such modifications as from time to time appear desirable, provision for the foregoing purposes can best be secured.

Sandwich.—The new church of St. John the Evangelist was opened last week by the Bishop of Chester. Completed save for the erection of the spire on the tower, the church consists in plan of nave, north porch, chancel, organ-chamber, and vestry on the south side. The whole is built of mottled red sandstone from the Five Crosses quarries near

Frodsham. The interior is of chiselled stone; the roofs and ceiling and the chancel are executed in oak. The nave and chancel fittings are in brown ash; the organ-case and fittings in the sacristy are of oak, the former being carved, and the front is embellished with sculptured angels holding a deep scroll. The floor of the sacristy is of vari-coloured marbles, sedilia and credence being provided on the south side. The altar rails are of wrought iron capped with oak rail. The frontals of the altar and the dorsal are of needlework. The west window of three lights is filled with painted glass, the subjects being "Faith," "Hope," and "Charity." The east window, and also two windows in the west end, and one in the tower over the font, are filled with stained glass. The latter represents the baptism of our Lord by St. John. The church is heated by hot water, and the lighting is by acetylene gas. The exterior roof is covered by small Westmorland green slates, and on the north side of the chancel is a sculptured niche with the patron saint of the church, St. John the Evangelist. Messrs. Beckett and Co. were the contractors, and the masonry was by Mr. John Palmer, of Frodsham; the chancel and other fittings by Messrs. W. and F. Brown and Co., of Chester, and the organ-case by Mr. H. F. Thomas, the architect being Mr. Douglas, of Chester. The nave, porch, and vestry have been erected at the cost of the parishioners, and the chancel, with tower, by Mr. Douglas, who also gave the site on which the church is built.

CHIPS.

A bronze statue of the late Sir Titus Salt, Bart., was unveiled in Saltire Park on Friday. The statue has been erected in commemoration of the hundredth anniversary of the birth of the late baronet, and the fiftieth anniversary of the opening of Saltire Mills. Mr. F. Derwent Wood, of Chelsea, was intrusted with the commission for the statue, which is 9ft. 6in. in height, and stands upon a pedestal 12ft. high.

The chancel and two bays of the nave of the new church of St. Thomas, Bedford-Leigh, Lancs., were opened last week. It occupies the site of a previous church. The cost of the portion already built, exclusive of furnishing, has been about £7,300.

The Lancashire County Council on Thursday in last week, after considerable discussion, sanctioned an application for powers to secure property near the present offices at Preston with a view to the building on the site thus enlarged of new premises for the transaction of county business. The scheme, which will involve the expenditure of a sum of about £100,000, will be further considered before definite steps are taken.

On Thursday in last week a Local Government Board inquiry into the Sittingbourne Urban Council's request for sanction of a loan of £6,000 to purchase the Milton Council's interest in the water-works at Keycol Hill, was held at the town-hall, Sittingbourne, by Col. A. J. Hepper, R.E., Local Government Board inspector.

A portrait of the late Duke of Westminster was unveiled on Saturday in the town-hall, Chester. The picture is a reproduction by Mr. Hanson Walker, of London, of the portrait by Millais representing the late Duke in hunting costume.

The death occurred last week of the artist in stained glass, Mr. V. Ostrehan, who carried out many important works, including a window to the memory of Sir Thomas More erected by Mr. H. C. Richards, K.C., M.P., at St. Lawrence Jewry.

The Leeds City Council approved on Monday the purchase from Mr. W. Gervase Beckett of the model lodging-house at the junction of Dyer-street and Millgarth-street for £16,500. The property is required in connection with the Quarry Hill unhealthy area scheme.

The Hudson River Tunnel from Hoboken to Morton-street, Manhattan, has reached the pier-line with the northerly shield, and the remaining 800ft. under the island to the New York shaft will doubtless be completed early next year. The southerly tunnel is not so far advanced, and cannot be finished until 1905.

Messrs. Wm. Potts and Sons, church clock manufacturers, Leeds, and Newcastle-on-Tyne, have received instructions from the memorial clock committee to erect a Cambridge quarter-chime clock at the Killamash Parish Church, Derbyshire, before the close of the year. They have just completed a new clock with two dials at Netley Hall, Shrewsbury, for Colonel Hope Edwards, J.P., and are now erecting church clock at Newcastle-on-Tyne for the corporation—got in competition. All the above are from Lord Grimthorpe's plans, for whom Messrs. Potts have made clocks for over half a century.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., L., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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. Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—M. H. D.—N. P. W.—R. S. and Son.—J. G. S. E. (Bristol).—H. B. P.—L. A.

KALAMAZOO.—If we understand your question right, owner of fence may serve notice to No. 2 to observe his boundary. He had better do this before moving the fence. Instead of the sketch of fence you send, a plan would have been more useful.

"BUILDING NEWS" DESIGNING CLUB.

F. H. ROBINSON. (We do not think there ought to be any difficulty in getting the plans of Solicitor's House on the sheet to 1/16th scale; but if this really is the case, you can use 1/16th scale for the plans. The larger scale is desirable.)

Correspondence.

POLICE AND FIRE STATIONS, NEW WINDSOR.

To the Editor of the BUILDING NEWS.

SIR,—The Competition Reform Society Committee disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: No professional assessor; elevations only required. The Corporation reserve the right of erecting the building without further payment to the successful competitor than the premium of £25; premiums insufficient.

Architects are requested to abstain from competing unless they receive a further communication to the effect that the conditions have been satisfactorily revised.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

10, Gray's Inn-square, London, W.C., Nov. 9.

UNSUITABLE MORTAR FOR METAL LATHING.

SIR,—Seeing how many patents there are for metal substitutes for lathing, it may be useful to your readers to have a note of an experience of mine in the use of one of these substitutes—namely, expanded metal. I was induced to use expanded metal, after a great deal of hesitation, on the lower surface of an iron and concrete floor, with the object of forming a key for a thick coating of ordinary lime-plaster, which was supposed to protect the floor from fire to a great extent. The expanded metal was entirely imbedded either in the cement-concrete or the plaster, and nowhere exposed to the air. After about eight years the ceilings are falling, the expanded metal having completely perished by rust. I am advised by an analytical chemist of great experience that this is due to the plasterer's mortar, which was composed of white lime and ground engine-clinkers—the ordinary materials here for "rough stuff." It is clearly necessary to be very cautious what the ingredients are of the mortar or plaster which is used with these metal lathings. I do not suggest that the expanded metal was any less suitable for its purpose than any of the other forms of these lathings.—I am, &c., E. W. M. CORRETT.

Castle-street, Cardiff, Nov. 5.

Intercommunication.

QUESTIONS.

[12022.]—**Worms in Furniture.**—Can any reader inform me how to destroy worms in furniture, and how to make it secure against further attacks?—CHAIRS.

REPLIES.

[12019.]—**Scarcement.**—You cannot claim more ground than that indicated by the figured dimensions, although your scarcements project beyond. In the absence of due provision in the feu charter the scarcements should not have projected beyond the boundary, and from the fact that they actually do, you have no claim to the ground they occupy.—D. FORBES SMITH, A.R.I.B.A., Kirkcaldy.

[12019.]—**Scarcement.**—If you write the Secretary, Surveyors' Institution, 12, Great George-street, Westminster, S.W., he would suggest good local man who could advise you.—REGENT'S PARK.

[12019.]—**Scarcement.**—The sizes given in the description of the piece of ground in the body of the Feu-charter, or—in the absence of such description—the figures on the plan, rule the whole matter, and apply to what is underground as well as above the surface. Anything outside the lines of boundary as laid down is an encroachment, whether it is by way of scarcement underground or by projecting rhomb above. Even the projection of a chimney cope or a window-sill over the boundary line can be objected to.—SCOT.

[12021.]—**Temporary Building.**—Landlord is likely to claim all put into his land, but, as I presume, not that resting thereon. Look out half a dozen names in Kelly's Directory of portable house builders. There are many special linings for inside of walls and ceilings, or outside for roofs, such as Uralite. A good insulating material is silicate cotton. There are also several roofing materials, felts, &c., in weekly building papers or in Kelly's worth inquiring about. Notice to local district surveyors, of course.—REGENT'S PARK.

The Bishop of St. Albans consecrated at Walthamstow, on Saturday, the Church of St. Barnabas, which has been built at the entire cost—some £20,000—of Mr. Richard Foster, of Chislehurst, Kent. The church is built of red brick, with stone relief work. It takes the place of a temporary iron structure.

Princess Christian of Schleswig-Holstein visited Limehouse on Saturday afternoon to lay the foundation-stone of the Limehouse Church Institute. The new institute is estimated to cost £7,000, towards which £5,722 is promised. The building will contain billiard-rooms, clubrooms, gymnasium, kitchen, a hall to accommodate 400 people, &c., with electric light throughout. The architect is Mr. W. H. White.

A statue of the Redeemer, about 17ft. in height, sent from Denmark, has been erected on the right side of the steps leading to the Royal Mausoleum, Frogmore, by order of Queen Alexandra, in memory of Queen Victoria, "the best of mothers-in-law."

A receiving order has been made in the case of William Henry Waterman, of Cullum-street, Fenchurch-street, E.C., architect.

LEGAL INTELLIGENCE.

HOLBORN AND STRAND IMPROVEMENTS.—EX-PARTE THE TRUSTEES OF ST. GILES' CHRISTIAN MISSION OF LITTLE WILD-STREET, LONDON.—In the Chancery Division on Saturday, before Mr. Justice Joyce, the petitioner asked the sanction of the Court to £3,865 being invested, and a sum not exceeding £7,000 laid out in erecting a chapel and buildings in substitution for the chapel taken by the County Council for the Holborn and Strand Improvements. The old chapel was leased to the Trustees in 1639 at a peppercorn rent, and compensation for taking it had been paid to the amount of £11,623 10s. The seventeen present Trustees agreed with the Council to purchase from them a contiguous site for £3,865 on which to erect new buildings, and the sanction of the Court was asked for dealing with this sum by investment, and for £7,000 to be expended on erecting a new chapel. (The new building will be erected at the corner of Great Wild-street and Wild-court, from plans by Messrs. Ernest Runtz and Co., and was illustrated by plan and perspective in our issue of April 17 last.) Mr. Justice Joyce granted the petition with liberty to apply as to the balance.

IS AN OPEN CHANNEL A SEWER?—WILKINSON V. THE LLANDAFF AND DINAS POWIS RURAL DISTRICT COUNCIL.—In the Court of Appeal, on Saturday, Lords Justices Williams, Romer, and Stirling gave judgment in the appeal by the defendants against a decision of Mr. Justice Phillimore's. The action was tried at the spring assizes at Cardiff in March last. The plaintiff claimed an injunction to restrain the defendants from permitting any foul or noxious matter to remain in a surface-drain at the side of Millbrook-road, in Dinas Powis, within the defendants' district. The plaintiff also claimed damages on the ground that foul matter in the channel had caused the illness of his child. The main question in the case was whether the channel was a "sewer" within the definition contained in section 4 of the Public Health Act, 1875. If it were a "sewer," the defendants were by section 19 of the Act bound to cleanse it. The channel was an open one, carrying off surface water from the road, and in the channel were gratings or gullies to carry the water into a deeper underground drain. The channel also carried off water from the roofs of some of the houses at the side of the road, and from the curtilages of those houses by means of pipes connected with the channel. Some sewage matter had found its way into the channel, but not through any fault of the plaintiff, who occupied one of the houses; it came from another house. Section 4 of the Act provides that: "'Drain' means any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed. 'Sewer' includes sewers and drains of every description, except drains to which the word 'drain' interpreted as aforesaid applied, and except drains vested in or under the control of any authority having the management of roads and not being a local authority under this Act." By section 19: "Every local authority shall cause the sewers belonging to them to be constructed, covered, ventilated, and kept so as not to be a nuisance or injurious to health and to be properly cleansed and emptied." Mr. Justice Phillimore held that the channel was a "sewer" within section 4, and that it was the duty of the defendants to cleanse it. And he granted an injunction, and gave the plaintiff £30 damages. The defendants appealed. The Court now dismissed the appeal. Lord Justice Vaughan Williams was of opinion that the decision of Mr. Justice Phillimore must be affirmed. There was no ground for differing either from his finding of the facts, or from the law as he had applied it. What were the facts? The rain-water from the roofs of several houses, and the surface-water from the ground in their curtilages drained into this space or channel at the side of the road. It followed that this channel, if it did in fact constitute a "drain," was not within the definition of a "drain" in section 4. Then the definition of "sewer" included "drains of every description," except certain specific drains, one of which was a "drain" as previously defined. It was quite plain that this channel was a drain of some sort, and it was not within the exceptions in the definition of "sewer." This being so, the only remaining question was whether this portion of the highway over which the surface-water ran was within the words "drains of every description" in the definition of "sewer" in section 4. It was contended that it was not, because it was difficult to define its lateral extension—that there was no edge separating it from the highway. This did not make any difference. The Court must have regard to the purpose for which the channel was made. It was made for the purpose of draining the water from the surface of the road, that the water might be held in a confined space until it reached the grating which was to carry it away. Under the circumstances it appeared plain that the channel came within the

words "drains of every description." It carried off the water from the road, and also from some of the houses. His Lordship only decided that in the present case the learned Judge was right in holding that this channel was a "sewer" which the local authority were bound to keep in proper order. He did not decide that an agricultural drain carrying off water from several separate premises would necessarily be a "sewer" which the local authority were bound to keep in order. It was said that it had been decided that a drain might be a "sewer" for some purposes and not for others. If that was the effect of the decision in "Kinson Pottery Co. v. Poole Corporation" (1899), his Lordship could not agree with it. But he did not think it decided anything of the sort; nor was it necessary for that decision to do so. Lord Justice Romer and Lord Justice Stirling delivered judgment to the same effect.

A HEYWOOD ARBITRATION AWARD.—Mr. Robert Evans, F.R.I.B.A., F.S.I., Eldon Chambers, Nottingham, has issued his award in the claim of Earl Wilton against the Lancashire and Yorkshire Railway Co. for compensation for lands compulsorily acquired at Broadfield, Heywood—viz., 1a. 2r. 18p. on the north side of the railway, and 2a. 3r. 27p. on the south side. The total amount of the claim was, approximately, £1,500. The witnesses for the claimant were Mr. W. H. Elwell, F.S.I., and Mr. James Green, F.S.I. (Messrs. Weatherall and Green). On behalf of the company, Mr. H. Sheldermine, F.S.I., estate agent to the company, and Mr. J. Sellers, land agent, Bury, were called. The arbitrator has awarded the claimant the sum of £947 11.

ESTATE AGENT'S COMMISSION.—Mr. Justice Kennedy and a common jury, in the King's Bench Division, heard on Tuesday a case in which Messrs. Giddy and Giddy, house and estate agents, carrying on business in the West-end, sought to recover commission said to be due from Earl Russell in regard to the sale of Amberley Cottage, Maidenhead, to Mrs. Atherton, the wife of Colonel Atherton. The defendant admitted that Mrs. Atherton was introduced by the plaintiffs, but denied that the sale was the result of such introduction. The property was eventually disposed of for £1,140, and the jury, finding in favour of the plaintiffs, and that defendant had promised them double commission, assessed the damages at £140 5s.

WHAT IS "CHIPPENDALE" FURNITURE?—Mr. Justice Darling and a common jury, in the King's Bench Division on Monday and Tuesday, tried an action brought by Von Zivergerberg, a Swedish gentleman, residing in London, against Messrs. Herbert and Co., furniture dealers, Tottenham Court-road, for damages for alleged false representation and breach of warranty in respect to the sale of furniture. Counsel, in opening the plaintiff's case, said his client bought furniture from the defendants to the amount of between £400 and £500, and among the articles he bought were some described as "Chippendale" furniture, but were really "Chippendale pattern," and distinctly inferior. To the plaintiff the name "Chippendale" carried the idea of old furniture. Certain other articles were alleged to be tapestry, but they were not tapestry, but were serge. Counsel argued that when a person calls an article "Chippendale" it was a warranty that it was made by Thomas Chippendale, and not merely furniture after the style of Chippendale. Counsel said his client was told that what he was buying was antique furniture. The defence to the action was a denial of false representation and a breach of warranty. The plaintiff then gave evidence, and said he was shown the furniture, which he was told was good old second-hand furniture by Chippendale, and worth three times the price asked. There were a sideboard, a mantelpiece, twelve chairs, and two armchairs, and he was asked £60 for them, which he agreed to pay. He had paid defendants altogether £485. In cross-examination plaintiff denied that what the defendants represented was that the furniture in question was "in the Chippendale pattern." He did not know that it was almost impossible to obtain real Chippendale furniture now, and that the pieces he bought, if genuinely antique Chippendale, would have been worth about £300. Mr. Leroni, a traveller in the furniture trade, said he considered the furniture was of ordinary quality, and had been sold at from 15 to 20 per cent. more than was charged by ordinary retail firms. In cross-examination, witness said the so-called Chippendale was a crude copy of Chippendale. Whether a reasonable man expected to get a Chippendale suite for £60 in Tottenham Court-road would depend upon the statements made to him. For the defendants evidence was given that the furniture supplied was well worth the money paid by the plaintiff. The term "Chippendale" was a recognised term in the trade to denote furniture of that pattern. Genuine old Chippendale was very difficult to obtain and was very expensive, and the defendants represented the furniture in question to be of the Chippendale pattern. Mr. Chiswell, the man who made the "Chippendale" chairs, said that he generally charged 30s. apiece for them. Mr.

Marler, a director of Gillow and Warrig, of Sloane-street, said he had valued the furniture in question, which was accepted in the trade as "Chippendale" furniture, at £100, a larger price than the defendants had charged. The price of £60 was a very reasonable price for the furniture he saw. He could not understand how the chairs he saw could be produced at 30s. apiece. In the result the jury found a verdict for the plaintiff for £50 on the claim. Judgment was given in accordance with the finding of the jury.

Our Office Table.

SOME seven years ago the noble sum of £100,000 was handed over to the town council of Edinburgh, as a bequest from Mr. Usher, for the erection of a memorial public hall. After heated controversies over the choice of a site, it has at length been determined to erect the Usher Hall on the land in Castle-terrace, now occupied by the Synod Hall buildings, belonging to the late United Presbyterian Church of Scotland. The site has only one good frontage, but that is placed between the parish council and school board offices on the high ridge overlooking the north-west angle of the gardens in the valley, beyond which is the High-street. It was originally expected that the building to be erected on so prominent a site, near the centre of the favourite view of Edinburgh, would be selected by competition; but acting on a recommendation from their Lord Provost's committee, the town council recently decided, by 32 votes to 14, to intrust the work to Mr. Morham, the city superintendent of works, a proposal which has aroused widespread dissatisfaction among those concerned for the amenities of the city. In view of the fact that this decision comes up for confirmation at the meeting of the council to be held on Tuesday next, a well-attended and influential public meeting was held on Friday night in Dowell's Rooms, George-street, under the auspices of the Edinburgh Citizens' and Ratepayers' Union, to urge on the council that competitive plans should be invited. Sir Colin G. Macrae presided, and in a stirring speech urged that the talent and genius of the council could not be evoked if important public works were intrusted to officials. An example of what competition could evolve was shown by the Scott Memorial, opposite the selected site for the Usher Hall, where an obscure and little-known young architect was successful out of 54 competitors. It was stated that the late Mr. Usher desired that a design should be selected in open competition. A resolution was unanimously adopted strongly disapproving of the plans for the Usher Hall being entrusted to the city architect, and urging that the design should be thrown open to competition.

Mr. F. W. Ruck, of Maidstone, the county surveyor, has addressed a letter to the members of the Kent County Council on the subject of Mr. D. Joscelyne's recent trenchant criticisms in his report on main road management in the county, epitomised in our issue of the 16th ult., p. 533. He proceeds first to deal with the matter as it affects him personally, inquiring into the cause for his implied dismissal in Mr. Joscelyne's recommendation for the appointment of a competent engineer-surveyor, who, it is suggested, should be obtained from outside Kent, and therefore new to the county and its influences. He deduces from Mr. Joscelyne's remarks the fact no sort of incompetence, inefficiency, or negligence in the performance of his duties can be charged upon him, and that the expert only finds that he is overworked. He admits his partnership in the firm of Ruck and Smith, but states that it is now undertaken by his partner alone, he devoting the whole of his time to the work of his appointment. He emphatically declares that he has never received any pecuniary or other advantage for the use of quartzite or any other material, and that he has no interest in any contractor's business. He cites his long association with road management, and protests his competency to manage the roads under the suggested district control system, or to carry out any reforms that may be decided upon; and he adds that he cannot suppose the council would willingly part with a county servant of his standing except upon the clearest proof that he is incapable of carrying out the duties pertaining to his office to the best interests of the county.

COMMENTING ON Mr. Joscelyne's criticisms of the collection of materials, he points out that there are really 5,237, instead of only 1,320, stone

depots—a fact which bore very materially on the question of second haulage upon which Mr. Joscelyne laid stress, and he quotes other counties which have such depots and do not take stone direct from stations or wharves to the roller. He enumerates the difficulties and disadvantages of purchasing material by weight; against these the advantages of the depot system are named, and he recalls the fact that in 1898 the number of assistant surveyors was reduced to four. Dealing with the preparation of estimates, Mr. Ruck argues that the actual experience and knowledge of their roads of the assistant surveyors is likely to be of more practical use in deciding which roads require repair than any procedure on hard and fast lines. He combats the statement that the roads are over-metalled, and says that now the haunches of the roads are thoroughly strengthened he looks forward to the quantity of material being annually lessened. Mr. Ruck controverted the suggested waste of between £200,000 and £300,000 on the roads during the past twelve years by asserting that an inspection would not bear out a statement which meant that 32,288 yards of material had been annually used that were not required.

A MEETING was held on Wednesday at the Society of Antiquaries, Burlington House, under the presidency of Lord Balcarras, M.P., for the purpose of founding a National Art Collecting Fund, analogous to the society already existing in Paris and Berlin, with the object of securing pictures and other works of art for our national collections. Viscount Knutsford moved a resolution constituting a council, and Canon Rawnsley seconded the motion, which was unanimously carried. Other resolutions in accordance with the object of the meeting were spoken to by Mr. Justice Darling, Sir Wyke Bayliss, Mr. Humphry Ward, Mr. Holman Hunt, and others, and adopted.

THE first meeting of the 150th session of the Society of Arts will be held on Wednesday evening next, when an address will be delivered by Sir William Abney, K.C.B., vice-president and chairman of the council. Among the papers to be read before the Society after Christmas are: "Lessons to be Learnt from the Fire Brigade Appliances at the late International Fire Exhibition," by Mr. Edwin O. Sachs; "Organ Design," by Mr. Thomas Casson; "Mahogany and other Fancy Woods available for Constructive and Decorative Purposes," by Mr. Frank Tiffany; and "Artificial and other Building Stones," by Mr. L. P. Ford. A course of three Cantor lectures on "The Majolica and Glazed Earthenware of Tuscany" will be given on successive Monday afternoons in the spring, by Mr. Langton Douglas.

THE Carpenters' Company are holding their annual examination on sanitary building construction in their hall on November 26 and 28. It is expected that the number of candidates entering will be as large as in previous years; but we would draw the attention of intending candidates to the fact that the last day for sending in their names is very close. We understand that the Company's certificates, and more especially the medals awarded, are more prized each year; candidates find, even in distant colonies, this hallmark of knowledge helps them in their careers.

THE report and recommendations of the departmental committee appointed to inquire into the administration of the Scottish Board of Manufacturers have just been published. The committee recommended that the Board of Manufacturers should be reconstituted and reduced in numbers, and its name should be changed to Board of Trustees. The duties of the board should be the administration and management of its accumulated funds, and the application of its income for the advancement of art in Scotland. They should further exercise a general supervision over and ultimate control of the National Gallery and National Portrait Gallery. They should also continue to hold in trust Dunblane Cathedral. A new school of art for Edinburgh should be established on the lines—so far as possible—of the Glasgow School of Art. The Applied Art School should be incorporated with the new school, but should remain subject to the control of Sir Rowand Anderson as long as possible. The constitution of the National Gallery should be assimilated to those of the National Galleries of London and Dublin. The present curator and his successors in office should bear the title of "director." He should possess liberal powers in the purchase of pictures, and in the general management of the gallery as a going

concern, subject to the ultimate control of the board of trustees. An application to Parliament for a "grant in aid" of at least £1,000 for the purchase of pictures should be made, unfettered by any condition as to an equivalent amount being subscribed by private liberality. These recommendations should come into force immediately as regards the existing National Gallery, and should apply equally to the new National Gallery, included in the recommendations. At the National Portrait Gallery, the same principles should be followed as in the case of the National Gallery, and there should be an annual grant of £200 for the purchase of pictures. A new building should be erected or acquired for the National Gallery. Towards the erection of this building £20,000 should be contributed by the trustees from their accumulated funds, the balance being provided from Imperial funds. When the new National Gallery is erected or acquired, the whole building at present occupied by the National Gallery and Royal Scottish Academy should be handed over to the Royal Scottish Academy, to be used by that body exclusively for art purposes, such as exhibitions of works of art and art education. The existing grant of £200 per annum for five years for the purchase of antiquities should be made permanent. The increased charges that would be put upon the annual votes if these recommendations are adopted would amount in all to the very moderate sum of £4,200.

Mr. G. D. MARTIN, F.S.I., in a letter to the daily Press, expresses his disappointment and regret that the London County Council have abandoned their intention to widen the narrow bottle neck of Sloane-street at the Knightsbridge end, where the properties are about to be rebuilt. Sloane-street, which has a general width of 65ft., is here contracted to 45ft., and Mr. Martin states that the abandonment of the scheme rests solely upon the question of expense of repaving, amounting to the very small sum of, perhaps, £1,000. Surely this cannot, and certainly ought not, to block the way to this important and much-needed improvement, and possibly if the residents and landowners in the neighbourhood feel strongly as to the value and necessity of the widening they will themselves raise this comparatively small sum, and so enable the County Council to go forward.

The Belfast Corporation discussed at their last meeting a report presented by a sub-committee upon a charge of £840 11s. 6d. made by Messrs. H. and J. Martin, and certified by the architect, Mr. Thomas, for erecting a stand at the New City Hall for the ceremony of unveiling the Queen's statue during the recent royal visit. It appeared that the original estimate was £359, but the plans had been slightly altered. The sub-committee declared that the architect's certificate for £840 was in distinct violation of the committee's resolution that Messrs. Stephen, the quantity surveyors, should measure and price the work. Alderman Henderson considered that the report of the sub-committee was unfair, as it attacked the architect, who had not had an opportunity of replying. Councillor Barkley sharply criticised the bona fides of the charge. In the original plan prepared by Mr. Thomas it appeared that he had only provided for 1,050 people on the stand instead of 1,800. A stand had been erected in Bangor to accommodate 2,000 people at a cost of £120, and the sum charged by Messrs. Martin meant about 10s. a seat. The Lord Mayor said as regards the stand, it certainly cost a great deal more than it was intended it should cost, and on this occasion he must say the architect should have consulted the committee before giving his certificate. After the discussion had lasted an hour and the members were waxing eloquent in their determination to resist the heroic charge for the stand, it transpired that the money had been already paid. The Lord Mayor expressed his disapproval of these premature payments, and pointed out that no such cheques ought to issue save with the authority of the corporation. At the same time it appeared that it had been the practice hitherto for the committee to pay what was certified for. The subject then dropped.

At the annual meeting of the American Institute of Architects just held at Cleveland, an address was read by the President, Mr. C. F. McKim, Royal Gold Medallist for the present year, who laid stress on the recent increase and betterment of our schools of architecture in Harvard, Columbia, Pennsylvania, Cornell and Illinois Universities, as well as in the still older

foundation of the Institute of Technology in Boston. Incorporated in the presidential address was a cable message from Mr. Aston Webb, R.A., stating that the Washington Commission Park improvement plans were, in his opinion, as fine as they could be. A resolution of approval of the great and life-long services of Professor Ware, and expressing regret at his withdrawal from active professional work, after having acted as the pioneer and organiser of architectural education in the United States, was unanimously passed.

An architectural curiosity is, says the *American Architect*, to be seen in New York, on ground formerly a part of Alexander Hamilton's farm, Hamilton Grange. The rector of the Roman Catholic parish of Our Lady of Lourdes, finding that his parishioners needed a new church, and had not much money to pay for it, decided to build it out of secondhand materials, of which there happened to be a large supply in the market. The old Academy of Design had just been pulled down, and he secured the black and white marble and the carvings of that structure, and arranged to incorporate them in the new building. Then the marble Stewart House, which once stood on the corner of Fifth Avenue and Thirty-fourth Street, was demolished, and Father McMahon secured the materials of this imposing Renaissance mansion; and, finally, the Archbishop made him a present of the marble of the temporary east end of the cathedral. Naturally, the mixture of the Truth-in-Art Veneto-Florentine Gothic of the Academy of Design with the French 14th-century style of the Cathedral, and these, with the Corinthian pilasters and rusticated corners of the Stewart mansion, give a somewhat peculiar effect; but, as Father McMahon says, those who do not like the outside of the building had better come in and see if what goes on inside will not please them better.

The building boom in Johannesburg is, says the last issue to hand of the *Times of Natal*, at its height. Never before in the history of the city has such an enormous number of buildings been in process of erection at any one time. For the most part the new structures are business premises, designed to meet the enormous expansion which, it is confidently anticipated, will take place before long. The day of flimsy business premises on the Rand has passed. Massive structures of steel, stone, and brick are displacing tin shanties and jerry-built houses, and though one may still see the familiar one-story tin hut nestling under the shadow of a five-storied solidly-built edifice of stone, the process of transition is being hurried swiftly onwards. The latest additions to the business palaces are the two new buildings that occupy the northern corner of Pritchard and Eloff-streets. This, the fashionable business quarter of the town, is rapidly squeezing out the dingy sheds that have so long constituted its chief adornments. With the pressure taken off the railways, and with materials of all kinds coming to hand promptly, building is being pushed forward without delay. Plenty of labour is also available. For £4 per month black labour can be secured in abundance, whilst there is scarcely a job in town that could not secure any day a score of carpenters, bricklayers, and plasterers more than are required for the work in hand. Although there has been no slackening in building operations, there are more skilled workmen to-day seeking employment than is usually the case. At the present time carpenters and bricklayers receive 22s. 6d. per day and plasterers 24s.; foremen in each case receive an additional 4s. to 5s. per day. At the present rentals for houses and the high cost of living, this wage is by no means extravagant. There is, however, a proposal on foot to reduce the wages to £1 per day.

The death is announced of Mr. Arthur Cayton, architect and surveyor, Southend-on-Sea. Trained in the borough surveyor's office at Southport, he was afterwards appointed borough surveyor of Southend, but resigned some years since to practise independently in the latter town.

Earl Roberts unveiled at Windsor on Friday the memorial statue to the late Prince Christian Victor which has been placed at the foot of the Hundred Steps to the Castle. The statue, of bronze, which stands in a niche beneath a carved canopy of Edithweston stone, represents the late Prince in campaign uniform, bareheaded, his sword by his side, and a pair of field-glasses in his hand. The sculptor was Mr. W. Goscombe John, A.R.A., and the architect Mr. J. W. Nutt, M.V.O., of Windsor.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Le Trésor de Coide et les Monuments de l'Art Iouien à Delphes," by Mons. J. T. Homotte. 8 p.m.
Liverpool Architectural Society. "The Bill for Altering the Law of Ancient Lights," by H. Chatfield Clarke.

TUESDAY.—Institution of Civil Engineers. "Tensile Tests of Mild Steel, and the Relation of Elongation to the Size of the Test-Bar," by Prof. W. C. Unwin, F.R.S. 8 p.m.

WEDNESDAY.—Quantity Surveyors' Association. General Meeting to approve memorandum and articles of association and appoint office bearers. Duke's Saloon, Holborn Restaurant. 4 p.m.
Architectural Association. Discussion section. "Practical Travelling on the Continent," by M. G. Pechell. 7.30 p.m.
Society of Arts. Opening Address by Sir William Abney, vice-president. 8 p.m.
St. Paul's Ecclesiastical Society. "The Blednow Inventory of 1781," by Dr. J. Wickham Legg, F.S.A. St. Paul's Chapter House. 8 p.m.

THURSDAY.—Society of Architects. Inaugural Address by the President, Walter W. Thomas, of Liverpool. St. James's Hall, Piccadilly. 8 p.m.
Leeds and Yorkshire Architectural Society. Opening Meeting.

FRIDAY.—Architectural Association. "Farm Buildings," by H. M. Cantley, A.R.I.B.A. 7.30 p.m.
Glasgow Architectural Craftsmen's Society. "Planning and Construction of Burgh Buildings," by James C. Walker. 8 p.m.

THE ARCHITECTURAL ASSOCIATION.

NOVEMBER 20th: ORDINARY GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. PAPER by Mr. H. M. CANTLEY on "Farm Buildings." LOUIS AMBLER } Hon. Secs.
H. TANNER, Jun. }

CHIPS.

The Croydon Corporation have appointed Mr. W. H. Prescott, engineer and surveyor to the Tottenham Urban District Council, as surveyor of the schools under the education committee at a salary of £150 a year. They have referred to the works committee a letter from Mr. A. E. Pridmore, A.R.I.B.A., for the past five years architect and surveyor to the late Croydon School Board, with reference to the compensation to be given him for loss of office.

Mr. Rushforth has, owing to ill health, resigned the directorship of the British school at Athens. The committee have appointed as his successor Mr. H. Stuart Jones, tutor of Trinity College, Oxford, with Mr. Thomas Ashby as assistant director.

The memorial to the late Dr. Bradley, Dean of Westminster, will take the form of the addition of his portrait to the long series of deans now on the walls of the Deanery.

The ancient church of St. John's, Leeds, built in 1631-3, the finest ecclesiastical building of the city, was reopened on Friday after restoration at a cost of £1,500.

A Local Government Board inquiry was held at Croydon yesterday (Thursday) into the application by the corporation for sanction to borrow £3,550 for works of surface-water drainage at Woodside Green and neighbouring roads, and for concreting a part of Norbury brook; also £13,000 for the erection of a refuse destructor at Brimstone Barn, Factory-lane.

Sir Gerald Raoul de Courcy Perry, Consul General at Antwerp, who died on April 9 last, aged 67 years, has bequeathed portraits of his grandfather and grandmother by Sir Thomas Lawrence to the National Gallery.

St. Clement's Schools, Oxford, are being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Premises situate in Busby-street, Bethnal Green, and used as steam sawmills, workshops, and stores by a number of cabinetmakers, joiners, and timber dealers, were destroyed by fire on Friday. The building belonged to Messrs. Webster, of Bethnal Green-road, and, being sublet for steam-power purposes to a number of tenants, was closely stored with great quantities of timber of every kind.

On All Saints' Day the Dean of Salisbury dedicated a new altar frontal illustrating the "Te Deum." In the centre is a representation of our Lord seated in glory, His right hand raised in blessing, and His left bearing the orb and sceptre; at each of the four corners is an archangel. On either side are four panels, each containing four figures elaborately worked. The frontal has been designed by Mr. S. Gambier Parry, and is the entire work of Mrs. Weigall, with the assistance of her daughter, Mrs. Aldworth, having occupied nearly seven years.

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INSTRUCTIONS TO ARCHITECTS.

HOW far an architect is justified in departing from the instructions of his client is a question that can only be answered by considering another question: Whether the instructions are the best or the most reasonable in the circumstances? A professional man is engaged for a special purpose—as, for instance, to design a building which will meet the requirements and satisfy the client; he is not engaged to comply with conditions which are doubtful, or that the client could not accept. That is to say, if the client asked for requirements that were unreasonable, the architect would certainly be to blame if he designed a building to meet such requirements, knowing they were undesirable. In short, no professional man would be bound, legally or morally, to comply with instructions which he knew would be unsatisfactory and cause his client injury; he is employed to bring his knowledge and experience to bear upon the problem for his client's benefit, or otherwise his employment would be useless. If we accept this position or principle as the right one, it follows that a professional man has a discretionary power open to him to depart from his client's "instructions" when he thinks it necessary. But there are two kinds of instructions: those which furnish simply facts and data, which a client would give to his legal adviser; and "instructions," which lay down a course of action or set forth the requirements of a plan, such as those which are given to the architect or competitor before he proceeds to make a design. It will be seen the two kinds of "instruction" are very different—one merely furnishes the necessary particulars, the other suggests a plan or a scheme in certain particulars. It sets forth the accommodation required, the dimensions of rooms, their position, they define positions for certain rooms and entrances, &c. To some extent, instructions in the latter sense are dictatorial or arbitrary, and appear to be undesirable. A medical practitioner or lawyer or engineer would not tolerate such instruction in his professional procedure. A painter or sculptor or any other artist would consider it a gratuitous insult to be instructed in his work. The architect stands in another category. He is not expected to know every business or trade or the habits of his client, and before he can prepare a plan he must learn certain things; he must have certain data as to dimensions and accommodation furnished; his art is one in which the imaginative faculties are not paramount; he has to consider utility and actual requirements, and so to a certain extent is restricted. Before he can make a design for a building he has to listen to his client's wants and tastes or business requirements, and the more thoroughly he can enter into his client's wishes, habits, and mental surroundings, the more successful is he in fulfilling his task. It is not every one who can throw himself heart and soul into the wants of a client, and it is not the letter of the instructions so much as their spirit he has to master. The architect may know better than his client what he really wants and how best to accomplish the work, and it is just this inner meaning which is obscured by instructions. The professional man has to try and master the real meaning and intention of his employer, to do which he must be master of the problem set before him. A formal set of instructions, such as those drawn up by a

committee for competing architects and probably interpreted by an official before they are printed, is often a very loose and incoherent document. It is vague in essential points, and leaves much to the imagination, or, on the other hand, it may be drawn up in so narrow and rigid a manner, that it does not give any scope to the competitor to exercise his own discretion. It may, for instance, define certain requirements and give a schedule of accommodation in superficial feet or dimensions, which cannot be complied with, without the sacrifice of some other condition—for instance, lighting area. At the same time, it may tie the competitor down to a certain cost which may render the scheme impracticable. Several competition conditions we have lately seen have rendered it almost impossible for the competitor to comply with them. Either the accommodation required is larger than can be provided for the cost prescribed, or there is a condition to provide rooms on one floor which is not possible. The competitor is placed in a dilemma: he has to reduce the area of a room or department, or put it on another floor, by which he places himself outside the terms of the competition. The hard-and-fast set of conditions is unfair to those who have something better to offer but are afraid to incur the risk of being rejected. It is equally unjust to those who have been bold enough to exercise their discretion in showing a better way. There is an intermediate class of conditions, those which have been carefully considered and discussed, or which have been drawn up with the assistance of the assessor. No excuse can be offered for non-compliance or for any eccentricity of treatment. While it is obligatory for a competitor to use his "own" judgment in interpreting a vague and insufficient set of instructions; and to adhere closely to the terms of a rigid and hard and fast set; in the latter case he is conscientiously bound to comply with the meaning and spirit of the conditions. Any architect on the very threshold of his design can perceive the reasonableness of the provisions, and he is at liberty to ask any question which may arise in his mind as to any point that he cannot quite understand. A reasonable and well-drawn set of instructions will leave some points to the discretion of the competitor: it will not be too precise in its terms: it will not say that every dimension given is to be rigidly followed; but will make the schedule as far as possible approximate. It will allow the competitors the liberty to modify any arrangement if they deem it necessary, and to adopt a style of architecture suitable. A few recently drawn up conditions based on the recommended form issued by the Institute have been of this kind. The conditions issued by the Acton Urban Council for their New Public Offices are a good example; the Council were assisted by an assessor in drawing up the conditions, and to assist in the selection. There were certain grounds stated on which competitors could be disqualified: for instance, if the conditions and schedule of accommodation are not substantially adhered to; if the design is not the work of the competitor; and if the competitor canvas, directly or indirectly, any member of Council, or reveal his identity. These conditions are reasonable; they are not exacting; the clauses are few and clearly stated, and avoid any overlapping and confusing provisions. As regards cost, no amount is stated, but only the rate per cube foot and what that rate should contain, and how the cubical contents are to be calculated, so that each competitor was left to work out his design upon data of the same kind. Every competitor is thus placed on a level, and the amount of his estimate will show exactly the relative costliness of his design. When competitors are asked to give an estimate of the cost upon their own cubing and rate per foot, there is a strong tendency to make the

latter agree with the amount, whatever the limit of cost may be. Often a rate per cube foot is mentioned that is quite inadequate, or the cubing is taken just as the competitor likes. There can be no uniformity or reliability in these calculations. We have often seen the most elaborate design priced at a lower rate than others of plainer description. By fixing a rate per foot cube that is known to be reasonable, the difference in cost must entirely depend on the cubical contents of the building or the area covered, and there is an inducement to economise area of plan. At the same time the accommodation required ought to be determined, the competitors being allowed to modify the areas specified. The condition as to cost is a very important one, upon which a great deal is made to rest. When a certain sum is stated as the limit of cost, we do not see how any conscientious competitor can depart from the condition. It is a fixed quantity, but it is often difficult for the competitor to cut his design accordingly. The requirements given are, perhaps, impossible to be obtained for the money; the scheme is too large, and the only alternative is to reduce it or to reduce the price per foot, which may be impossible. The more satisfactory mode is to state the rate per foot cube which is a fair price for the building. The competitors are then left to design a building that will contain every requirement. Though this plan does not define the amount to be expended, it encourages the competitor to be economical in the plan, especially if the committee express a desire to select the least costly. There are, in fact, three elements: two may be fixed as the rate per foot cube and the accommodation, and the other, the cost, be left open. When the cost is stated it becomes a fixed quantity, and the other two factors, the accommodation and the rate per foot cube, may vary. The former may be reduced as the price per foot is increased, or *vice versa*. But by fixing the price per foot, and also the accommodation, there cannot be a great variation in the estimates submitted—any difference between the designs will be due to the skill of the architects in providing the accommodation on a smaller area than other competitors. And this plan is the fairest; it enables the designer to devote his best energies to the planning of the building in the most economical manner, for he knows that the smaller the cubical capacity of his design the less costly it will be, and the more he will be able to spend in details and fittings. But when the limit of cost is fixed there is the temptation to undercut, to price portions of the building at a rate which can only mean scamping and inferior work. And yet this latter plan is generally followed in competition conditions, and, as we have said, it is one of the instructions which cannot be safely departed from without injustice to other competitors; while the other method we have noticed, that of fixing a rate per foot cube, allows a little more freedom.

The supplementary instructions often given to competing architects in reply to questions are a proof of the want of clearness of the conditions issued, and the frequent ambiguity of the clauses. For instance, questions as to boundary and limits of land often occur. A competitor sees a great advantage if he can set back his frontage line instead of following the boundary all through, so as to make breaks in his front. A clause, for instance, in a late competition set of conditions stated that the "architects must be guided in their designs by the arrangement shown on the site plan, and, whilst not strictly bound to same, they should keep as near as possible to the principal features." Several questions were asked by competitors, one, whether the front could be brought out in a certain part, another as to what features were intended to be followed, and the answers to those several questions became new instructions; many were in doubt as to the meaning. In

another recent case, a clause stated that "the schedule of accommodation and requirements must be adhered to; but the competitors are at liberty to slightly modify the areas of the various rooms." The interpretation attached to the words "slightly modify" were evidently taken in different senses: the successful competitors (it was a limited competition) actually went so far as to provide only one suite of rooms for kitchen, rooms for dinners and dancing, &c., instead of the two suites asked for. How the words "slightly modify" could be so stretched we do not know. The condition to provide distinct entrances for the public part of the building and the offices is another provision which cannot in fairness be taken to mean only one. But the questions asked by competitors and answered are often such as to so "whittle" down and modify the original instructions to the degree that they become no longer tenable. As far as possible the conditions should be so clear and intelligible as to render any supplementary instructions quite unnecessary. They compromise the position of the promoters. A does not know the exact question which B. has asked, but sees the answer, and probably interprets it in quite another way. B., C., D., &c., ask other questions, and receive answers which put a different construction on the conditions; the result is that practically a modified set of conditions takes the place of the old. In such an instance—we do not say that it is always so—the architect cannot be called upon to implicitly accept the instructions first issued. He must be prepared to exercise an open mind on the instructions.

It seems, therefore, desirable that to promote unanimity among the competitors, the instructions should be definite as far as they go, leaving the competitors free to use an open mind on points that are not mentioned. Such points as site, ancient lights, frontages, entrances, exits, accommodation of an absolute necessary kind, areas of certain rooms, besides instructions as to levels, heights, heating and ventilation, ought to be clearly defined. From these there should be no departure possible; but there are unimportant questions relating to proportion of rooms, the desirability of additional rooms, which rooms should be placed on each floor, questions of arrangement and location of departments and entrances which may be regarded as optional. The main thing is that the chief points absolutely essential should be fixed and unalterable, so that there can be no doubt left in the mind of the most inexperienced competitor as to what is intended. When these are determined, supplementary information and answers to questions that are often not clearly understood are undesirable and provoke dissatisfaction. In both private commissions and public competitions, the client or promoters look to the architect to design something which they are not in a position to do for themselves; in either case he has to use his professional skill and discretion in interpreting the conditions, not simply as a mechanical draughtsman to prepare designs according to a prescription. This latter view of the profession is, however, overlooked. The ordinary employer is apt to regard the architect's function as a merely mechanical one, the output of a number of drawings in accordance with instructions, though at the same time he is held responsible for the result.

NEW ENGLISH ART CLUB.

THE modern pictures on view at the Dalley Gallery, Piccadilly, vary very much in subject and quality. There is the same striving after "modern" or advanced ideas in painting, a great deal of the experimental in the methods adopted, and a few achievements of merit. Taking the collection in the order of the catalogue, we note several

very effective sketches in water colour, pencil, and crayon, a few of the former remind us of the outline sketches of the early water colour artists, like Sandby, Girtin, and others of the school in which the colouring is exceedingly slight, being merely simple washes of local colours or tints. Amongst sketches of this class we may refer to Douglas Robinson's sketch of an old house, "In the Park" (1); Harry Tonks' sketch, "A Golden Evening," in simple tints of yellow ochre and blue, and his equally slight study, "An Autumn Morning" (14), an avenue of trees in the sunlight, very broad and effective in the tints; Francis E. James's "From my Window at Instow," and "Sketch, Instow," the first a river scene between meadows. Other sketches include Alfred W. Rich's "Brighton" (3); D. S. Maccoll's "The Market Church, Richmond, Yorkshire," an outline sketch, but the vertical lines of tower are not true; his delightful little study "Indian Pinks" (15) in a cup; and "The Mill Stream" (21); William Orpen's "The Woman in White" (9), a stormy dark landscape; H. B. Brabazon's "On the Riviera" (11), a "note" of tone; Muirhead Bone's "Moonlight, Melrose," an effective pencil sketch; P. Wilson Steer's broad and vigorous study (19), "The Weir," a work showing depth of tone and power in foliage and sky; Professor Fredk. Brown's "A Waterfall," in this painter's strong, vigorous style; W. W. Russell's "Bridge, Barnard Castle," a sketch with local tints. Some effective work is done by H. Bellingham-Smith (29, 43); Alfred W. Rich, in his solidly-handled landscape, "Storrington Common" (38); Henry Tonks, in his vigorous study "The Storm"; and by Roger E. Fry, "A Village Pub," a reed-pen outlined, tinted sketch. Proceeding up the gallery to the oil pictures, we notice several artists have been painting Yorkshire scenery. W. W. Russell's large sunlit landscape, "Barnard Castle, in Teesdale" (54), is one of the most striking—an expansive valley bathed in sunshine. Mr. Russell suffuses his landscape with a golden radiance. "The Mill Dam" (122) is another work by this painter, equally strong. Professor Fredk. Brown paints with much power, though there is a want of breadth in some of his work. "A View of Richmond, Yorks" (74) is chargeable with this quality. The strong lights, admirable in their way, have no corresponding relation of shadow, and the effect is broken up. Cumulous clouds, through which the sun's rays pierce and light up a landscape, are seen in R. Wilson Steer's powerful work, "Richmond Castle, Yorks" (118), where the flicker of ambient light on castle and trees is realistic. The wild, stormy sky, "loaded" with white pigment, is powerfully painted. "On the Swale," by Professor Brown (58), has the same quality and technique. In fact, the works of P. Wilson Steer, Professor Brown, and W. W. Russell have much in common in their treatment and style. "The Shower," by the first-named (108), is a skilful realisation of sunlight through banks of cloud, the town partially lighted by gleams of golden sunshine. The distance merges into the clouds, giving the sense of falling rain. This, and the same painter's "Richmond Castle," noticed above, are notable works of this master of clouds and atmosphere, whose labours in this direction have been aided by the late wild weather. Max West (59) essays an experiment in "The View," a girl in strong blue dress, sitting on a hillside viewing a wide landscape, the harsh note of the blue coming into strange harmony with the green of the landscape. Sombre in its deep tone and grey light of sky is "The Village Inn" (60), an evening effect by David Muirhead, painted with his usual power, and his bluish-grey landscape, "Autumn." The "River Scene," by D. S. Neave, with profile of St. Paul's dome, as seen from the river, is subdued

and pleasing in colour. W. Rothenstein has again selected for his themes dark-clad figures set against cream or ivory white surfaces. "Mother and Child" (61) is, on the whole, a successful experiment, but we scarcely think so happily treated as it might have been. There is a stiffness in the straight lined back of the chair in which the mother is seated, who holds by his hands her little son on her lap. The blue frock of the child contrasts with the light panelled walls and chimneypiece of 18th-century character, which receives the light from the window. The black dress of the young mother contrasts with her rich auburn hair, while there is a creamy softness and delicacy in the lighted panelling. The technical qualities of the work and the details of chimneypiece are admirable, but it is a scheme of colour and tone. His subject, "The Morning Room" (77), shows another treatment of the same scheme of tone. The same panelled background is employed, against which are posed two ladies, one reading at a table, the other, probably a sister, standing by a fireplace. The small octagonal-shaped long window adds interest to the interior, but the figures are less contrastive. The late Hugh Carter's "Interior of a Court House" is an admirable example of that clever artist's skill as a painter of interiors and figures. It is admirable in tone. A. Ambrose McEvoy's "The Book" (65) is another skilful interior study, in which the relation and composition of the figures are excellent. One lady, in rich maroon dress, is looking at a large folio volume on an old bureau, the other lady is stooping over her. The accessories exhibit knowledge, and the tones are delicate and harmonious. James Charles, in his "Sweet Rest" (66), a sunny meadow with cows reposing on edge of stream, is charming in touch, and next we come to P. Wilson Steer's "A Turn of the Cards" (69), a girl in light green dress, who leans forward from a settee on a small table, and is shuffling a pack of cards. The drawing and expression of face are not the strongest points, but rather the delicate colour of the dress and tints of the face and light blue of the wall behind. Another clever suggestion of flickering light on leaves is James Charles's "Picking Verne" (70), after which we may mention James Henry's nice-toned and subdued "October Morning," Alfred Thornton's "Monte Bignione" (72). William Orpen, whose work is always refined and technical, has an admirable portrait subject, "Portrait of George Moore" (73), exhibiting the best qualities of the painter; it is a small study. The attitude of the sitter, pensive in face and posed sideways in the chair, his face expressive and receiving the light from the window, is unconventional. The head is resting on the hands. The light reflection and the red curtain to window are skilfully handled. His main work forms the centre picture at the end of gallery, and is "Colonel and Lady Eva Wyndham (Quin and Family)." There may be different views of the success of this large family picture; but at least it is a difficult subject to arrange and compose a family group of several figures. The point of attraction is a black Pomeranian dog. A little boy is drawing the dog's attention, while the father and mother—the latter seated—and two young daughters standing are apparently taking an interest in the dog's movements. The subject is treated with much realism, and the light is well arranged on the figures and accessories of room; the gradations of tone are successfully handled. His portrait of Augusta Everitt (90) is also an earnest presentment of features. Then we have his crayon sketches, "The Bath" (133) and "After the Bath" (137), a mother and her infant, very free and cleverly treated. "Miss Isola Russell, Snake Charmer of New York City" (81), by Sholto Johnstone Douglas, is well handled. Mrs. Ethel Walker in "The Roses" (79), a figure of a lady, in a drawing-room, stooping over a

basket of flowers on a chair, is decidedly graceful and delicate in drawing and colour, and her portrait of Miss Darroch (83) is realistic. "Evening Sunlight" (82), a study of a girl seated at a kitchen table, is charming in the reflection of light on the wall and the simplicity of composition of the quiet interior. It is by Mrs. Mary McEvoy. Miss Lily Blatherwick (Mrs. Hartick) contributes a pleasing picture, "The Orchard," a hillside of white blossom, delicate in colour. Miss Alice Fanner also has a river scene at Datchet of merit.

One of the cleverest works by a lady artist, Miss Marion Powers' (99) "Heirlooms," represents a sombrely painted interior, its darkness broken by subtle reflections, and by the glittering plates of china which fill the shelves of a large dresser. It is painted with much power and subtle skill. A girl crouched on floor, half in deep shadow, is cleaning a large plaque. Next we have one of the most captivating portraits in the gallery—that of "Mrs. M. B. Furse," by Chas W. Furse (107). This lady is shown as a half-length, graceful in pose, standing against a garden or landscape with trees. She wears a low cut-white dress with a lilac sash, and a large picture hat with roses. A richly-trimmed blue cloak loosely hangs from her shoulders. The reflected light adds charm to the face and figure of this very originally handled and graceful portrait. A. Bellingham Smith's view of "Knaresboro', Yorkshire" (102), is a bridge scene, but lacking breadth. J. R. K. Duffs has a sylvan glade, "Through the Trees," with sheep, delicate in tone, and Mark Fisher (106) a strong rendering of a meadow in sunlight, "An Irish Pastoral." Miss Alice Fanner sends an Argyllshire view, "Stormy Weather," a clever hillside under a stormy sky. We may also mention as creditable works A. E. John's portrait of "Professor John Macdonald Mackay," in red robes (113); A. S. Hartrick's "In Arcady," in which his technical power and delicate treatment are manifest in the steep upland; L. A. Harrison's "Study of Sea" (112); and a blossom-edged garden—a sunlit effect (115); Bernard Sickett's "The Castle of Ischia" (116); Moffat Lindner's "Ebb Tide, St. Ives Bay" (120); a portrait by C. H. Shannon of a lady in light grey dress, leaning forward; Alex. Jamieson's "View in the Oratory" (123); D. Murray Smith's "St. Margaret's, near Dover" (124); and Mrs. Mary McEvoy's "The Canary Bird." There are also a few interesting chalk studies by A. E. John and A. Orpen. The exhibition will repay study, not so much for conspicuous merit, as showing a few new departures in study and treatment.

THE SOCIETY OF ARCHITECTS.

THE first meeting of the session 1903-4 was held at St. James' Hall, Piccadilly, W., on Thursday, Nov. 19, at 8 p.m.

THE LATE MR. SILVANUS TREVAIL.

The President, Mr. WALTER W. THOMAS, in opening the proceedings, said the beginning of the session had been clouded by the unlooked-for death of their late President, Mr. Silvanus Trevail. The news had come as a great shock, and the circumstances under which so useful a life had been suddenly terminated was a matter for the deepest regret to the Society, with which he had been connected for eighteen years, and no less to the senior architectural body, the R.I.B.A., with which Mr. Trevail had been associated as a Fellow for ten years. A vote of condolence to the relatives was unanimously passed.

During the evening the following gentlemen were elected to membership and studentship:—

For Hon. Membership: Colonel C. O. Ellison, past president, 22, Sir Thomas-street, Liverpool.

For Membership: Franklin Joseph Bellamy, 18, High-street, Yeovil; Alexander Burnett Brown, 12, Norfolk-street, Strand, W.C.; Percy Martin Da Feu, 3, Buona Villaa, Ventnor; Saml.

Doddimeade Edmunds, 79, Victoria-street, St. Albans; William Longfield Hill, 38, Albion-street, Leeds; Herbert William Hillier, 83, Palace Chambers, Westminster; Aubrey Burton Houchin, Bloomsbury Mansion, Hart-street, W.C.; William Herbert James, 4, Bloomsbury-place, W.C.; Rowland Lloyd Jones, 14, Market-street, Carnarvon; Charles Mitchell, 132, Princes-street, Edinburgh; William John McWilliams, Library Buildings, Port Elizabeth; George Meek, 20, Leinster Chambers, Manchester; William Henden Winder, 48, Bedford-row, W.C.

For Studentship: Clive Ewart Ardley, 5, Baron's Court-road, West Kensington; William Heather Evans, 8, Portland-street, Southampton; Walter Scott Mackintosh, 63, Denzil-avenue, Southampton; Joseph Peasood, 5, Thornton-road, Stanwix, Carlisle; Oliver George Bond, 15, All Saints-place, Stamford; Herbert Longstaffe Webb, 64, Berners-street, W.; Evelyn Shirreffs, 10, Hyde Vale, Greenwich; Isaac Alexander Simpson, 104, Bewsey-road, Warrington; John Stalker, P.O. Box 1038, Johannesburg, S.A.; James Stewardson, Petterhill Bridge-terrace, Carlisle.

The balance-sheet for the year ending Oct. 31, 1903, showing a reserve fund of £700 and a surplus of over £1,100, was adopted. The PRESIDENT then delivered the

PRESIDENT'S ADDRESS FOR 1903-4.

To elect a man to the office of President is to bestow upon him the highest honour which it is in the power of the members of a society to confer, and to place upon him many responsibilities, not the least of which is the preparation of a presidential address. Let me say at once that I greatly appreciate the honour done to me, not merely from a personal point of view, but as the representative, as it were, of that large body of country practitioners which is the backbone of the Society, and to whose support it is largely due that the Society holds its present position in the architectural world. One result of the existence of so many architectural societies is that about this time of year there is somewhat of a plethora of presidential addresses covering much the same ground, so that it becomes a matter of difficulty to prevent clashing, though, on the other hand, one may perhaps learn what to avoid. The very few remarks which I shall address to you to-night will deal so far as possible with that practical side of our profession, more particularly with the various questions taken up by the Society, and indicating some of the directions in which it might extend its sphere of utility, for the welfare of the Society is surely a member's first care, seeing that the stronger it becomes the more advantages it will be able to give him. I am fortunate in coming into office at a time when the Society is in so prosperous a condition, a state of things for which we have to thank those who in the early days of difficulties and in the face of much adverse criticism and strenuous opposition stood by and supported it. The Society has arrived at a stage of its existence when its sphere of utility and influence has been demonstrated beyond question, and when it might well essay to stand alone, not only in regard to such matters of general interest as Registration, but on questions which more particularly affect the members, such as a scale of charges, a form of contract, articles of pupilage, conditions under which alone a member will compete, &c. Let me first deal with one or two matters of general interest.

ARCHITECTURAL EDUCATION.

Nothing has done more to promote the advancement of architecture in this country of late years than the gradual development of schools of architecture, and the institution of chairs of architecture in connection with the universities of Liverpool and Manchester, the former being the first of the kind in this country, and the latter owing its existence largely, I believe, to the efforts of the Manchester Society of Architects. Most of the allied societies afford facilities for gaining knowledge, the Leeds and Yorkshire Society being perhaps the most prominent with a new scheme which has every indication of being successful. And I trust before long the University of Wales, at Aberystwith, will have its school of architecture, which will have my hearty support if established. The new school of architecture in London in connection with the Architectural Association has just completed a most successful first year's work, and is deserving of the hearty support of the profession; its curriculum is unique and its scheme admirable, providing as it

does a means whereby a man may test his adaptability for the profession before binding himself down for a term of years, thus enabling him to withdraw in good time if he finds that his abilities are such as would have better scope in some other profession. The great fault of the usual system of pupilage, to my mind, is that in many cases a youth is bound down for a term of years, only to find at the end that he has mistaken his vocation and wasted time and money. In Ireland also this question is receiving consideration; but, after all, these praiseworthy efforts to raise the standard of architectural education do not much more than touch the fringe of the profession, for the reason that the system is a voluntary one, and until schools of architecture are State supported, or, in other words, a system of statutory education is established, it is hopeless to expect that more than a small proportion of students will avail themselves of the advantages now open to them. A system of compulsory education would do good in two ways—it would show to the intending student exactly the course of study which he must necessarily take if he ever aspires to be more than a subordinate, and so would enable him to shape his studies from the first with a definite object in view, while the mere fact of a certain standard being set up, which all must reach, would tend to stop the ever-increasing stream of incapables who are now attracted to the profession by the fact of its being open to all. This question naturally brings one to a matter, in which the Society is particularly interested—viz.,

STATUTORY REGISTRATION.

Does it not seem to be not only common sense, but common justice, that a man who has entered the profession by legitimate means, that is, by spending his time and money in properly fitting himself for its duties and responsibilities, should be protected against the bogus practitioner whose only claim to the title of architect is the fact that it appears on his door-plate? The principle of registration is one against which a valid objection has never been made; it is only when it becomes a question of carrying into effect that principle that objections are raised on certain points by those who are so bigoted and prejudiced as to be unable to consider the matter from any point of view other than their own narrow one, and who endeavour to obtain a cheap popularity by the easy way of indiscriminate condemnation of a measure of the clauses of which it is evident they know nothing at all. Very little to my mind is gained by controversy, but much may be accomplished by persistent and continued effort towards a definite end. No amount of argument can get over the fact that the profession is practically solid on the principle of registration, and when it comes to fighting out the details the common sense of the majority must win. It is not my wish or intention on this occasion to go deeply into the pros and cons of the question, but I should just like to take one point. If I understand our opponents rightly, their main objection to the Bill is based on the assumption that it will be the means of indiscriminately registering all and sundry without question, and that thereby the evil which they admit now exists will be increased. This only shows what irresponsible statements can be made and what inflated nonsense is talked in the hope of stemming the tide. It is true that Parliament will not pass any measure which does not protect properly vested interests, and quite rightly, but that is a very different thing from registering indiscriminately. The Bill provides for registering only those who can prove to the satisfaction of the General Council that they were before a certain date and are still actually practising architecture, the General Council being composed of a body of architects in the nomination of whom the R.I.B.A. has the preponderating influence, and the choice of who shall be registered rests entirely with the General Council, which might be supposed capable of properly adjudicating on the claims placed before it. The president of one of the allied societies recently said in effect that an imperfect Bill was better than no Bill; this is perfectly true, because the least that a Bill would do would be to stop admission to the profession except by legitimate means, and for that reason alone it would deserve every support. The position of an objector who is already a member of any architectural body is an untenable one, because he has already admitted his agreement with the principle by voluntarily registering himself, and that objector forgets that though he may to a certain extent protect himself by so doing, yet so far as the public are

concerned he cannot prevent these persons he may consider unqualified from inserting their names alongside of his in the public directories and other lists, so that he is to all intents and purposes compelled to submit to be classed in the public eye with all and sundry who may care to assume the title of architect, so that he at present suffers the indignities which he pretends to fear would be the result of a Registration Bill. Every man has a right to his own opinion, and if there are a few who are genuinely satisfied with the present state of affairs, or who are unable to express an opinion one way or the other, there are very many others who are not content, and who will agitate until they get what they want. It is understood that the architectural societies generally are in favour of registration, and that some of them have urged the R.I.B.A. to take the matter up. That is as it should be; the senior body is the right one to take the lead in this. But because it does not do so, that is no reason why others should not, and the support that the Society has lately received shows that it is recognised that it is not fighting for its own hand, but in response to a generally expressed feeling in the profession that the time has come when the matter should be taken up in earnest. The tendency of the times is towards federation, and in matters architectural there is the same feeling and desire for consolidation, and for some strong central authority to control the whole. Straws show which way the wind blows, and recent events in Ireland and elsewhere make it plain that the senior body is acting against its own interests in not fairly and squarely facing the question of registration. It is encouraging to find the President of the R.I.B.A. making registration the principal theme of his address, and to have his assurance that the Royal Institute is in sympathy with every effort to raise the status of architecture and architects in this country, which, of course, includes the registration movement; but it is evident that the only practical way of obtaining the desired end—viz., by Parliamentary powers—will not be sought by the Institute until it has tried every other possible scheme. The proposal to form a Board of Architectural Education, if carried out, may be useful in focussing and controlling the efforts of the various schools of architecture throughout the country, but it will do nothing at all to remedy the grievances which, it is admitted, exist in the practice of architecture. As usual, the Institute fears to definitely pledge itself one way or the other on the question, though it admits that the large body of opinion in favour of compulsory registration cannot and must not be ignored. The Institute is apparently on the horns of a dilemma; anxious to propitiate those few leaders who object, and at the same time knowing that the general body of practitioners must be reckoned with, it proposes a middle course: that of a scheme of voluntary education, which, however good and desirable in itself, will be unable from its very nature to deal effectually with the question. Such a scheme will not at all appeal to practical men who are aware that nothing less than statutory powers will enable any authority to deal effectively with such an important question as the education and consequent necessary registration of architects. The present situation may be summed up in a few words: It is admitted that grievances exist which should be remedied; the question is, how? Very many of us know and say that there is but one practical way, while a few others are anxious to try various schemes before accepting the inevitable; but let those who think they can by any means effectually hinder progress in this matter remember the legend of the Saxon King who was taken down to the seashore and told what a clever fellow he was. He showed his advisers, however, that he could not stop the advancing waves, and if our opponents care to see a parable in that, the advancing water is the tide of progress, which they can no more stop than could the wise old king the waves.

PUBLIC IMPROVEMENTS AND BUILDING RESTRICTIONS.

There must necessarily be certain restrictions and conditions imposed upon those who propose to erect buildings; but one would naturally think that when these conditions emanate from the landowner, who is presumably anxious to dispose of his sites, that they would be of such a character as to encourage rather than put off an intending buyer. The opposite seems to have been the case in the Holborn-to-Strand improvements. Those who have read the conditions of sale will see at

once that they are of a character calculated to make the boldest hesitate; the decision on any point afterwards arising is in the hands of the Council's architect, from which there is no appeal. The objection is not a personal one to the architect as such, but to the principle which places so much power in the hands of an official. There must be something wrong when the opportunity to secure sites in so valuable a centre fails to attract purchasers. I think the conditions should at any rate be subject to an appeal and arbitration in case of dispute. This is a question not only for lessees, but for architects, who have to advise their clients who propose to take sites. If there is no reference to an arbitrator in case of a dispute, a client may be mulcted in a large additional expenditure he never contemplated, and which may bring him to ruin.

CONDITIONS OF CONTRACT.

It is satisfactory to find that after negotiations extending over eight years a form of conditions of contract has been arrived at between the R.I.B.A. and the Institute of Builders, which contract defines as definitely as may be the relative positions and responsibilities of the building owner, the architect, and the contractor.

ARCHITECTURAL COMPETITIONS.

It is a sign of the time that a few architects should have been obliged to form themselves into a Competition Reform Society with the object of "blacklisting" competitions with the conditions of which they do not agree; and they have done good work in this way. But why was it left to them to take it up? Here again is shown the want of the strong hand. The present system of putting out designs to competition is one which has come to stay; and it is not to the credit of the profession as a whole that in spite of protests and requests that architects should not compete in certain instances, there are always found some who will disregard such requests; and it must lower those who enter in the eyes of the promoters themselves to find that there are men willing to quote terms on which they will undertake the work in the event of their being successful. Such practices want putting down with a strong hand. But who is to do it? Were there a statutory authority, it could absolutely control these matters by making it a question of professional conduct. Promoters would then quickly see that it was waste of time to come before the profession with any invitation to compete, the conditions of which were not in accordance with professional usage.

ASSESSOR AS JOINT ARCHITECT.

There is a matter in connection with the Liverpool Cathedral Competition which, I think, has not received the attention it deserves, and that is the appointment of the assessor to act as joint architect with the author of the selected design. I maintain that the principle is an entirely wrong one and opposed to the best interests of the profession, and I consider the attention of the profession should be called to it, and that steps should be taken, say, by the Competition Reform Society to bring the matter to the notice of those in authority. Also the competition for the Liverpool Pierhead Baths and Tramway Offices, which in the first instance proved a failure. Yet there were found six or seven firms of architects to enter into a second competition for baths only, without any assessor being appointed or any premium offered. Then there was the competition for the housing of the poor upon the site known as the Hornsby-street area, Scotland-road—another failure—the work being afterwards carried out by the corporation's own officials. Surely this state of things can only have one result, and that is to drag the profession through the mire. If the profession does not respect itself, what can it expect from the public and public bodies? You cannot find any other profession that would submit to this sort of treatment in the way the architectural profession does. I am glad to say that the firms of architects who act in this way are getting fewer every year, and the sooner they are wiped out the better for the profession. Having expressed my disapproval of certain things, I must give credit when credit is due. The Liverpool City Council and the citizens have done more than any other city in England to advance architecture and public improvements.

LIVERPOOL CATHEDRAL.

One of the most important works of modern times will be the cathedral it is proposed to erect in Liverpool, the proposed dimensions of which are quite equal to any of the ancient cathedral buildings of England. In fact, the two towers

will probably be higher than any church or cathedral tower in the British Isles. His Majesty the King has recognised the importance of the work by intimating his willingness to lay the foundation stone in the spring. The area of land covered by the buildings without cloisters will be about 10,200 square yards, a greater area than which only one or two, if any, cathedrals in England occupy. The committee has done exceedingly well in accepting the decision of the referees in the competition recently held. It had a precedent for appointing so young an architect as Mr. Gilbert Scott, for Mr. H. L. Elmes was about the same age when he won the competition for St. George's Hall, Liverpool. This leads me to say that I hope that a memorial to Elmes will, before long, be erected in St. George's Hall. But the cathedral is not the only great building that Liverpool is about to erect. The Liverpool Dock Board has recently had a competition, and a very satisfactory conclusion was come to when they accepted the designs of a local firm of architects. The Liverpool Corporation has completed and opened a new Technical School, built from the designs of a London architect. The Royal Insurance Company has recently erected a magnificent pile of buildings of the most modern construction. Then there is the New Church House in Lord-street. The banks and the large steamship companies and tradesmen appear to find their own offices and shops too small, hence old buildings are being pulled down and palatial new erections are taking their place, amongst them being new offices for Sir Alfred Jones. The city to which I belong has always been in the forefront—I might almost say has led public opinion with regard to all questions for improving the conditions under which the labouring classes have to live. The housing question has been taken up in an enthusiastic spirit, and made a special study of by the housing committee and the council. Although many admirable schemes have been brought to a satisfactory completion in the past, it is only a few days ago that a further scheme was inaugurated by H.R.H. Princess Louise to erect labourers' dwellings at a cost of £150,000. The Liverpool School Board, which has now ceased to exist, have made a particular study through their various architects of the highest standing in Liverpool, of school building, and the most recent one erected, Birchfield-road School, is, I suppose, as complete an elementary school building as will ever be erected.

ARCHITECTS AND THE EDUCATION ACT.

Whilst speaking of elementary education I would particularly like to draw the attention of architects to their position under the new Education Act. Most of the committees are formed of sub-committees of city councillors or county councillors or urban district councils. Now, most of these gentlemen seem to think the persons they ought to employ as architects and surveyors for their future new buildings are their city surveyors, land surveyors, county surveyors, road surveyors, and other gentlemen whose particular qualifications are more of the nature of land stewards, bridge masters, and road surveyors than architects. Now, there are gentlemen in our profession who, during the last thirty years, have made a particular study of school building, and it appears to me that the valuable experience that they have gained during that period will be lost to the community if the principle I have just indicated is persisted in. Most of the county and city surveyors have as much work as they can possibly personally attend to, and they have had in the past no practical or personal experience of school building. Therefore it is very important that we, as the Society of Architects, should bring before the notice of these various authorities the importance of appointing architects of experience in school construction to look after the supervision of their schools in the future, and not leave them in inexperienced hands, with results that will mean disaster and increased rates.

ANCIENT LIGHTS.

A question in which the Society of Architects is particularly interested is that of "Ancient Lights," which is to form a subject of discussion at our next meeting. The Bill which has been drafted by the Joint Committee of the R.I.B.A. and the Surveyors' Institution does not seem to do much more than take the matter out of the hands of the lawyer to put it into those of the surveyors, so that the benefits of the building owner are not increased—rather the opposite in some cases.

THE FUTURE OF THE SOCIETY.

Turning now to matters which more particularly affect the immediate needs of the Society and its members, I need only refer you to the report presented at the last meeting and the balance sheet which has been put before you for evidence that the Society is in a thoroughly sound position and entitled to look forward with some confidence to considerably extending its scope within the immediate future. It is within the province of every member to assist the Society in developing its resources to the utmost extent; its growth and influence depend on individual effort, and no opportunity should be lost of making the Society fully representative, particularly of that important section of the profession to which it especially appeals—viz., the provincial practitioner, who has more difficulties to contend with in his endeavours to honourably carry out his professional duties than perhaps the Metropolitan architect has any conception of. Particularly is this the case with the architect in the smaller towns, where perhaps the scope is not great, and where he has to meet encroachments on his legitimate sphere of practice. Membership in any corporate body not only confers certain privileges on those who gain admittance, but it also entails upon them certain obligations, one of the greatest of which is that of forwarding in every possible way the aims and objects for which that body was founded. Especially is this the case with a young and growing Society such as ours, which actively takes up questions it believes to be for the general good, in a way which no other architectural society has attempted. It speaks well for the Society that, in spite of, or perhaps because of, the institution of a stiff entrance examination and other tests as qualifications for membership, our numbers go on steadily increasing; but there is yet great scope in this direction, and it should be the duty and pleasure of every member to recommend for membership those whom he knows to be fully qualified, and so to enlarge the influence of the Society, and by this means show his practical interest in its welfare.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second ordinary meeting of this Institute was held on Monday evening at 9, Conduit-street, W., Mr. John Slater, Vice-president, in the chair, when a distinguished company assembled to hear a paper by M. Jean Théophile Homolle, hon. corresponding member, and director of the French School at Athens, who had come specially over from that capital to read it, the subject being

THE TREASURY OF CNIDUS AND THE IONIAN ART OF DELPHI.

On the walls were hung plans, and an ideal restoration in perspective, to an unusually large scale, of Delphi, executed by M. Albert Tournaire, and lent for the occasion by the French Government, and also a series of charmingly-rendered water-colour drawings of the recently-discovered sculptures in the frieze and pediment of the Treasury, the work of Signor G. S. da Fonseca. The address, which was delivered in fluent French, with but occasional reference to notes, was illustrated by some six-and-twenty lantern slides.

Having paid a glowing tribute to the memory of the late Mr. F. C. Penrose, and to the accuracy of his conclusions as to the optical refinements of the Greek temples, the lecturer proceeded to describe his recent discoveries at Delphi, and especially at the little building known as the Treasury of Cnidus, which he accepted as a typical work of Ionian architecture of the sixth century B.C. He was glad to have been associated in the work with English architects and archaeologists. He showed the position on a plateau below the theatre at Delphi of the famous Temple of Apollo, by the aid of photographs of the actual site and M. Tournaire's conjectural restoration of the building in its prime. At the first bend of the sacred way at the foot of the hill leading to this temple was built the Treasury of Cnidus. It was in absolute ruins; but it was possible to mentally restore, from the fragments which had been recovered and collected, together with other examples from elsewhere, but similar in character, some idea of its appearance. Having compared the actual ruins of foundations and fragments with an ideal restoration, M. Homolle proceeded to analyse the architectural details. The Treasury

was a small isolated building in *antis*, Ionic in style, about 25ft. by 20ft., surrounded by a continuous frieze. In front was a pair of gigantic female figures acting as caryatides, and supporting an entablature, frieze, and pediment, the two latter being richly ornamented with painted sculpture. In front of the building was a crouching sphinx, and a lofty pair of columns on either side, above an Ionic capital, supported each a winged flying female figure. M. Homolle said he proposed in the first place to justify the restoration thus shown by an analysis of the architectonic elements of the building and its accessories; secondly, to study the decoration of the monument in its architectural ornaments, properly so-called, in the sculptures in high or low relief, and also in the paintings, with which the effect of these were heightened; lastly, he intended to make a plan of the Treasury of Cnidus, and the importance of the Ionian art displayed at Delphi in its general relationship to ancient art, showing illustrations of the plan of the temples, and of many of the fragments. The author explained the basis for a restoration of the entablatures of the front portico, the side façades, and the rear. The beautiful sculptured frieze was, he pointed out, inclosed with a continuous ornament of ovolos in the cornice; the space above was decorated with palm foliage and lotus buds; the pediment, and the triglyphs both below the pediment and the side faces, and the acroteria were admirably carved, as were the sphinx and flying victories. M. Homolle also explained his grounds for the restoration of the approach steps, from the lower courses still remaining, on the analogy of those existing at the Treasury of Phocæa. The restoration of the caryatides and their bases were calculated from the known height of the monument; but in 1894 the trunk of one of the figures was found, and four years later its head was discovered, the two portions exactly fitting together, and agreeing with the previous estimate. Restorations were also shown of the Ionic capitals above the caryatides and of the doorway, from the models now in the museum at Delphi. One was impressed, when examining these remains of the Treasury, with the richness, even to surfeit, of the decoration, both in sculpture and as heightened by the polychromatic decoration afterwards applied to the carving. The architectural decorations were described in detail. The mouldings were decorated with beads and ovolos; the plain surfaces were ornamented with flowers, with palm-leaves, and lotus-buds, these being employed on the dripstones and eaves, the jambs and cornice of the gateway. There was a uniformity of *motif*, varied by appropriate adaptation to the several members of the architecture. An admirable excellence was displayed in the execution; a vigorous fullness, a trifle heavy in treatment, but powerful in effect. These gave a special character to the Treasury of Cnidus. The subjects of the bas-reliefs of the frieze were continued on all the four façades of the building. That on the west front illustrated the Apotheosis of Hercules; that on the south, the Carrying off of the Daughters of Leucippos; that on the east the contest of the Greeks and Trojans over the body of Euphorbos, under the eyes of the gods assembled in Olympus, and that on the north face, the Battle of the Giants. The bas-reliefs might be divided by their style and technique into two groups, each consisting of two friezes: one pair was in contour angular, the other smooth; one pair was modelled in the round, the other was flat in treatment. The proportions and the forms were those of archaic Ionian art of the 6th century; the figures were short and heavy, the technique was dry. The composition throughout was governed by the rigorous laws of symmetry. The principal figures were equally grouped around the principal motifs, in analogous and inverted attitudes as one receded from the centre. Occasionally a certain awkwardness in their compliance with the laws of unity was manifest, as in the contest of the Greeks and the Trojans under the eyes of the assembled gods. The drawing and composition recalled the painting of vases with black or red figures, in the severe style of the end of the sixth century. The sculpture on the pediment represented the wrestling between Apollo and Hercules for the possession of the tripod of Delphi. The style of execution in this pediment was, the author demonstrated, the same as that of the friezes; in treatment it most nearly approached the manner of the west and south friezes, but was somewhat more hard and coarse. This work has a mixture of high and low relief, the figures being partly

free and partly attached to the background. Passing on to consider the large sculptured accessories, M. Homolle pointed out that the sphinx and winged victories were of the type of those at Delos and the Acropolis at Athens. The caryatides figure which had been seen showed some resemblances to, but differences from, the archaic figures at Athens; but it had some traces of Egyptian influence. The polychromatic decoration had been copied with great precision by M. Fonseca in his remarkable water-colour drawings. Colour had been applied to architectural ornaments, to the frieze and pediment, and also the figures in low relief. A common principle had inspired all the work, which consequently has a general harmony and a monumental character, decorative and non-realistic in effect. Three colours were employed in this ornamentation—white, the colour of the marble, slightly modified by glazing; blue, applied to the backgrounds; and red for garments and other prominent features. Having demonstrated the resemblance between the sculpture of the Treasury and contemporary vase paintings, M. Homolle mentioned that the name of the monument—the Treasury of Cnidus—was given us by the inscriptions graven upon the building itself and by an incidental allusion by Pausanias. The style of the sculpture and of the architecture assigned it definitely to the 6th century, and the Asiatic Greek that of Ionia; we were driven to the like conclusions by a study of the history of Cnidus. It was then a work of the Ionian province—Ionian in workmanship and in spirit. It was rich to exuberance; vigorous, but a little heavy; but showed originality of invention, strength of handling, and marvellous ability in execution. In closing, the lecturer traced the persistence of these qualities in Ephesus, Branchides, Xanthos, Priene, and Pergamos; and showed slides of the well-known sarcophagi of Clazomenus and of Alexander.

Dr. ALEXANDER S. MURRAY, keeper of the Greek and Roman antiquities in the British Museum, in proposing a vote of thanks to M. Homolle for his splendid and eloquent address, referred to the Treasury of Cnidus as one of the most charming Greek buildings that he had ever seen. M. Homolle had proved by his convincing arguments and by the photographs and drawings, that the art was essentially Ionian. They were under a great obligation to him for coming all the way from Athens and for so clearly explaining his discoveries, but also as the instigator and superintendent of the extensive—he might say unequalled—excavations carried out at the cost of the French Government in Delphi. He trusted that M. Homolle would be able to complete his gigantic task.

Mr. GEORGE H. MACMILLAN, secretary of the Hellenic Society, seconded the motion, and remarked that M. Homolle had revealed to them, step by step, the mode in which he revealed the treasures so long hidden at Delphi. He hoped that next year, when the Hellenic Society completed its twenty-first year, M. Homolle would return to London and further explain the discoveries he had made.

Dr. ARTHUR W. EVANS, in supporting the motion, remarked that at Delphi they had the beginning of Greek religion, and it was interesting to note the marble face of a lion shown that evening closely resembling one of the objects disinterred at Knossos. He had seen the village which occupied the site before the excavations at Delphi were begun, and could appreciate the vast labour that had been carried out by M. Homolle, and the public spirit and generosity of the French Government, and trusted that the British Government would follow their example. The wonderful reconstruction of the Treasury from mere fragments displayed the genius of the explorer.

Mr. MYERS and Sir L. ALMA-TADEMA, R.A., also took part in the discussion.

The CHAIRMAN, speaking in French, explained the purport of the remarks to M. Homolle, and expressed the appreciation all present felt of the high services he had rendered to the archaeology of Asiatic Greece, and likewise the gratitude felt by the Institute Council for so generously lending the splendid array of drawings on the walls.

M. HOMOLLE briefly responded.

A verdict by consent for £7,550 has been given in the Sheriff's Court, London, to Mr. W. E. Brown and Mrs. Rowe, the freeholders of 2½ acres of land which are required for the extension of Brixton Prison.

THE QUANTITY SURVEYORS' ASSOCIATION.

A GENERAL meeting of this recently-formed Association was held on Wednesday afternoon at the Duke's Saloon, Holborn Restaurant, for the purpose of approving the memorandum and articles of association, and of electing office bearers. Mr. W. Hoffman Wood, F.S.I., of Leeds, was called to the chair. The attendance numbered about fifty well-known members of the profession, and the various proposals were keenly debated. Mr. F. B. Hollis, hon. sec. and treasurer pro tem., read the minutes of the preliminary meetings which led up to the organisation of the association, and also a lengthy correspondence which had passed between himself and Mr. Julian C. Rogers, the secretary of the Surveyors' Institution. Mr. Hollis had written explaining the proposals, and asking if the Council of the Institute would grant the use of one of the rooms in Great George-street, on loan or hire, for their early meetings, as the promoters desired to work in harmony with so influential and old established a body. In reply, Mr. Rogers stated that the request had been referred to a committee, who had come to the conclusion that there were many objections to multiplying associations for members of the same profession by creating a separate organisation for each separate branch, and especially to the setting up of competing systems of examination. Mr. Hollis read many letters of apology and regret for non-attendance, including those from Messrs. Henry Adams, A. T. Babbs, of Cape Town; J. A. Bonds, W. Prowse Broad, and W. M. Law, of Liverpool.

The Chairman expressed his gratification that out of very small beginnings, a letter he had written to the professional Press at the beginning of the year, so large and influential movement had arisen. Already some 150 members of the profession had promised to join, of whom about one hundred were practising in London and the other fifty in the provinces. Mr. Hollis had rendered the promoters valuable services in the early days, not only as hon. secretary, but by freely lending his office for meetings. They had met with a little opposition from unexpected quarters. A leading surveyor, Mr. John Leaning, whose books on the subject of quantities had been of such service, had written strongly objecting to any attempt on the part of quantity surveyors to form themselves into a society; but his criticism had been a blessing in disguise by attracting public attention to and advertising the proposal. It was difficult to understand the attitude of the Surveyors' Institution to the movement, nor why quantity surveyors should not avail themselves, as municipal, district, mining, and Ordnance surveyors, and other branches of the profession had done, to unite together and do all in their power to raise their status, and obtain improved regulations and better training for younger members. It was evident that many benefits would accrue to the junior practitioners from such an association. In nearly all builders' agreements architects' clauses were inserted, which in many cases provided that in case of dispute between architect and builder, a second architect should be called to decide. This might in some cases be very prejudicial to the original architect, and a more satisfactory arrangement would be to appoint the surveyor as arbitrator. The association would also endeavour to provide for fair competition for public works, and for uniformity of practice and charges. It must be left an open question whether, if an architect possessed the ability, skill, experience, and, he might add, leisure, he might not, if so disposed, take out his own quantities, and he for one would not discourage such a practice, and in the smaller towns this was a necessary element of the architect's business; but the habit of touting for quantities indulged in by some architects could only be deprecated. As time went on, it was to be hoped that the master builders in the larger towns would band themselves together and refuse to tender for any works but those for which bills of quantities had been prepared by a recognised member of that association.

A discussion ensued as to what should be the title, limitations, and object of the association. It was unanimously agreed, on the motion of Mr. Thomas J. Carless, seconded by Mr. R. L. Curtis, senior, and supported by Mr. Walter Lawrance, that the title should be "The Quantity Surveyors' Association."

The warmest controversy of the evening arose on the point whether membership should be

rigidly restricted to those practising "solely" as quantity surveyors, or extend to those who were fully qualified to take out quantities, but also carried on professional business as architects. The question was raised by Mr. R. L. Curtis, who said if the stricter interpretation were enforced he would be necessarily excluded. Mr. A. R. C. Buss, Mr. Taylor, Mr. C. W. Bowles, and several other London practitioners urged the desirability of excluding all who also acted as architects. This was opposed by Mr. A. G. Cross, Mr. A. J. Gate, Mr. T. J. Carless, Mr. R. L. Curtis, jun., Mr. G. A. Oviatt, Mr. H. J. West, Mr. W. R. Hood (who asked for a definition of a "fully qualified quantity surveyor"), Mr. Reginald J. Tollit, of Cambridge, Mr. H. L. Beckwith, of Liverpool, Mr. Lansdown, Mr. W. Lawrance, and others. Eventually Mr. Carless moved, and Mr. Hollis seconded, that "qualified quantity surveyors" be eligible for membership. An amendment stipulating that they be "solely" eligible was lost by a large majority, and the motion was then unanimously adopted.

Mr. J. Johnstone, hon. solicitor, read the memoranda of articles of association, and in answer to questions explained the various technical points relating to registration. Mr. A. J. Gate moved, and Mr. Joseph Aylott seconded, that the memoranda be confirmed and adopted. This was carried unanimously, as was, after some discussion, a resolution, proposed and seconded by Mr. A. G. Cross and Mr. H. England respectively, that the drafting of articles of association and the formulation of by-laws be left to the council hereafter to be elected. It was further agreed, on the motion of Messrs. Gate and Lawrance, that these should be subject to confirmation by the general body of members at a meeting to be specially convened.

The question of the constitution of the governing body was discussed at some length, the original proposition to appoint in all eighteen members—viz., a president, three vice-presidents, a council of twelve, with a secretary and treasurer to sit on the council *ex officio*, being rejected on fuller consideration as too unwieldy, and therefore without due sense of individual responsibility. It was therefore resolved, on the motion of Messrs. Gate and Cross, that the executive body should consist of only twelve members, from among whom the members should select the president, two vice-presidents, and a secretary and treasurer, leaving eight ordinary members of council. It was further agreed that of the twelve members of the executive eight should be chosen from gentlemen practising in the Metropolis and four in the provinces, thus securing representatives in exact proportion to the relative strength of membership. Thirteen members were nominated to represent London and five to represent provincial surveyors, and on a vote being taken the voting resulted in the election (as named in alphabetical order) of Messrs. H. L. Beckwith (of Liverpool), Curtis Card (of Lewes), H. Crickmay, A. G. Cross, R. L. Curtis, jun., H. England, F. B. Hollis, W. R. Hood, Walter Lawrance, R. J. Tollit (of Cambridge), and W. Hoffman Wood (of Leeds).

From among these names the officers and committee were elected as follows by open voting: President, Mr. Walter Lawrance; vice-presidents, Messrs. A. J. Gate and W. Hoffman Wood; ordinary members of committee, Messrs. Beckwith, Card, Crickmay, Cross, Curtis, England, Hood, and Tollit; hon. secretary and treasurer, Mr. F. B. Hollis. Messrs. H. J. West and John Nixon were appointed hon. auditors.

A vote of thanks to Mr. Hoffman Wood for his able and impartial conduct in the chair was, on the motion of the newly-elected president, heartily accorded, and terminated the proceedings.

PLUMBERS' EDUCATION AND REGISTRATION.

A CONFERENCE between the Plumbers' Company, the representatives of the larger water authorities of the country, and the Royal Institute of British Architects was held on Tuesday at the Guildhall to discuss the question of the technical education and registration of plumbers and the efficiency of plumbing work generally in connection with the public supply of water. Dr. Robert Crawford (Warden of the Plumbers' Company) occupied the chair, supported by Mr. Richard Hind, of Stockton-on-Tees (Renter Warden) and Mr. Coles (the Clerk), and there were also present delegates from the water authorities of Birmingham, Glasgow, Sheffield,

Hull, Bradford, Cardiff, Dublin, Plymouth, and other towns. The Royal Institute of British Architects was represented by Mr. H. D. Searles-Wood, Mr. Thomas Blashill, and Mr. W. D. Caröe, and the British Association of Waterworks Engineers by its secretary (Mr. Percy Griffith).

The Chairman remarked that the Plumbers' Company had done a great deal towards stimulating public interest in the matter of good plumbing, more particularly from the health point of view. Undoubtedly the country had been thoroughly aroused to the advantage to be derived from an increase of responsibility and skill on the part of the plumber. On its sanitary side, much that was of value had been done in the training of plumbers, and the attitude of local authorities towards plumbing had greatly changed as compared with what it was a few years ago. Of late, however, another department of the plumber's work had come into prominence—that relating to the prevention of the waste of water in domestic use. The Plumbers' Company did not suggest that the water authorities did not know how to manage their own affairs, but it was thought possible that the Company might act as a sort of line of union for the discussion of the means to be adopted in order to secure greater uniformity in respect of by-laws, fittings, and the skill and qualifications of plumbers. He moved a resolution approving the efforts of the Plumbers' Company to secure the more efficient training of plumbers and the registration of qualified men, and pledging the conference to support the Company's endeavours to obtain the necessary legislation in furtherance of that object.

Mr. Hind, in seconding the resolution, pointed out that the effect of the Company's efforts was visible in the improvement which had taken place in plumbers' work during the last 25 years. He hoped that architects and others would support the Company by employing registered and qualified plumbers in preference to others.

The Chairman mentioned that the Bill promoted by the Company for the registration of plumbers had been viewed favourably by the Local Government Board, but the Government had not seen their way to afford the necessary time to secure its passage through Parliament.

The resolution was carried.

Mr. H. D. Searles-Wood said that as architects they strongly sympathised with the movement for the better education of plumbers. He did not think, however, that they could pledge themselves to the sole employment of registered plumbers, because architects did not interfere between the contractor and his men. He proposed:—"That, with the object of giving practical effect to the previous resolution the representatives of the Royal Institute of British Architects and the water authorities present recommend that preference be given to the employment of registered plumbers to carry out and inspect plumbers' work executed under architects and water authorities." It was one thing, he remarked, to execute specimen joints and other things under the direction of a master in a highly fitted-up shop at a technical school and another matter to do it under the ordinary conditions in which the work had to be done in a building.

Mr. Holdsworth, Bradford, seconded the resolution.

Mr. E. A. Lees, Birmingham, said that in Birmingham there was a good many firms of the highest repute who had not allied themselves with the registration movement, and the Water Board could not shut their eyes to the fact that those firms carried out their work in a way to which no exception could be taken.

Mr. Atkinson, Hull, said the same difficulty would arise in his town. If registration was to be adopted, it should be optional for a period, and only compulsory after the lapse of several years.

Mr. Holdsworth observed that registration gave a status to a plumber, and was an inducement to men to register themselves.

Mr. Hind said that they could not at present hope to make registration compulsory, but they could make it desirable and to the advantage of plumbers to register themselves.

After further discussion, the resolution was carried.

The questions of uniformity of regulations and the standardisation of fittings was afterwards discussed, among the speakers being Mr. Blashill, Mr. Gale (Glasgow), Mr. Askwith (Newcastle-on-Tyne), Mr. O'Dowd (Dublin), and others, and it was decided, on the motion of Mr. Searles-Wood, to appoint a small committee representing

the Plumbers' Company, the Royal Institute of British Architects, the water authorities, and the water company engineers to consider the questions.

"BUILDING NEWS" DESIGNING CLUB.

A SECONDARY SCHOOL.

WE are sorry that, out of all the very large number of designs received in this the first competition for our Designing Club Session for 1903-4, there is not one plan which can be called satisfactory. The subject is possibly too special in its character to expect young architects to deal with it in a really efficient way to meet the requirements of a good, workable school and the rules of the Education Department, which necessarily govern the up-to-date details of secondary school arrangement. We have had some difficulty in arriving at an award, on account of the incomplete character of the designs in this respect, and the merits of the three best plans which we illustrate run each other very close, though the decision has been made on the principle of selection based upon that which is least deficient rather than that which is most perfect. Practically, of course, it comes to the same thing, though it is always better to make a choice because of the workmanlike efficiency and architectural merit of a design whenever it is possible to adopt this course. We fully recognise the difficulties which the students who took part in this contest must have experienced, and while we are bound to point out where they fail, we ungrudgingly commend one and all for the serious and careful way in which they have done their best.

These were the instructions:—

A.—A Secondary School for 150 boys, on an open site, with a frontage towards the south-east, facing the high street of a country town, in a freestone district. The playground will be at the rear, and the land falls 1 in 12 from S.E. to N.W., commencing at a distance of 20ft. from the street footway, where the site is level. The building is set back 15ft. from the street. The accommodation is to comprise an assembly-hall 50ft. by 25ft., and five classrooms, about 22ft. by 20ft. each. A chemical laboratory for twenty students, a preparation-room, and a balance-room; a physical laboratory, available as a lecture-room, about same area as the chemical laboratory; an art classroom for twenty students, and a small life classroom—both these to face north. A head-master's room, and a common room for the other teachers. Cloakroom for pupils, and latrines, lavatory, &c. Covered playground under part of the building, which is to be on two floors, above the ground level. Materials stone, and stone slate roofs. Style simple and picturesque. Scale for the drawings 8ft. to the inch. A plan of each floor, two elevations, and section, with a sketch view, which may be small. Drawings to be sent in so as to arrive at the office not later than October 31 next.

We place "Viking" first, "Ilex" second, and "Novocastria" third. "Viking" arranges his elevations and plans well on the sheet, and he draws clearly, though his method of blacking in the upper parts of his windows is somewhat misleading. If darkened all over, their ungainly proportions would be more easily detected. The widespread of his main roof gives breadth, though structurally there is only one place, between the central gables and the dormers, where a through truss can be inserted, while the head-room in the balance and preparation-rooms is very curtailed (see dotted line in section). The effect of the central gables is good; but the turret ought to show in the perspective, and might have been larger and higher as a matter of composition in design. There is no necessity in a secondary school for all the classrooms to open out of the central hall, and the disturbance caused by changing classes is lessened when a corridor, if only an open-sided one, is contrived along one flank of the assembly-hall. The faults of this plan of "Viking's" are the inadequate cloakrooms and lavatories, the absence of cloakroom and closets for the masters, the placing of their rooms upstairs, and inadequate provision for supervision in consequence. The entrances are exactly the same, and both have to be used by the pupils, whereas one should be more decidedly the boys' entrance and one more distinctly intended for masters' and visitors' use. The preparation and balance rooms should be made available for both laboratories. The covered playground shelter is rather good, and the balance in favour

of this plan was decided by the fact that the author gives two staircases, which are absolutely essential. It is not clear how the skylights over the first floor corridor are managed, and the section omits to show them. It also is uncertain how the roof comes with its central gutter extending so far back 'twixt the gables, the ridge line seemingly being set back in the centre in an amateurish fashion.

"Ilex" has a good first-floor plan, but he also locates his master's room up the stairway, and he gives no second staircase. The art classes being put on two floors is no advantage. The windows to the covered playground are absurd, and would always be broken. Externally they look as if they lighted rooms. The best feature in the elevations is the pretty arrangement of the central part of the front: but the cornices and moulded architraves in masonry are too expensive in style. The perspective is excessively poor. "Novocastria" gives no view. His windows are of ungainly proportions, and four stone gables cost money, though the detail is simple, and this row of gables is effective. The inconsequential projections for porches are too out up and trivial. The faults of both the first and second plans are repeated in this one, save that the teachers have one room on the ground floor. The arrangement throughout is more broken up, and the central hall is too much of a passage, with the stair arches at the ends, leaving no room for a good platform, a fault which "Viking" has committed in even a worse form, owing to the position of his classrooms. "Tudor" ranks fourth with a design marked by a prettily-conceived façade, though the turret is pimping. The open-timbered roofs over the hall and laboratories are not required, and that over the hall is ugly, cut up on one side to allow of the gallery. The plan is open to all the objections of the first three, with the addition that only one entrance is provided, and the staircase forms too much a part of the assembly-hall, while the gallery also would add to the disturbance. "Tudor" draws nicely. "Ionic" also is a good draughtsman. His plans are very indifferent, with one stairway and the master's room poked away out of sight. The author does not appear to have realised how school work has to be carried on. He makes his cloakrooms passageways, which is not allowable. We like his exterior design very well, and shall expect him to do better than this. "Digneori" does steer clear of some of the greater defects already alluded to, and he gives better cloakroom space and a head-master's room on the ground floor. He forgets that through ventilation is needed in cloakrooms, and he locates his preparation-room beyond the chemical laboratory, with no other access to it. The lecture-room is isolated from both, and the only way to the art-rooms is through the assembly-hall. The elevations are among the best. "Victis," too, is rather good in this respect, and he provides two staircases; indeed, he would have ranked much higher save for the objection which exists in consequence of the impossibility of reaching the second staircase except by passing through the first-floor rooms. The ground-floor is better; but the cloakrooms, which are in the basement, are too small. "Doublee" has several good points, and avoids the objections noted in the last scheme; but his hall is 27ft. high, with a roof above that which opens to the apex, which is a fault. There is only one main entrance, and as the masters' rooms are on either side of it, the noise of the pupils leaving school would be a serious objection. The cloakroom is too limited, and the boys' door in the basement being reached by the stairs next the head-master's room does not obviate the noise question just referred to. The elevations are plain and straightforward. We for some reasons prefer "Stoop"; but he runs his assembly-room half under the first floor and half outside, at right angles with the main block. The seating to classrooms is not shown, and the fireplaces are wrongly placed to allow the seating to come properly. The corridors would be very dark, and there is only one staircase. "Jingo" has a far better plan, spoilt by a too spacious entrance-hall with one staircase only. The boys' entrance is convenient, and the first floor is really in some ways good, though the end of the corridor should have been open for light; and the preparation-room is too small. Externally the design is commonplace, and panelled classrooms are beyond school builders' means. "Stoney" puts his hall on the first floor, and spoils his classrooms by giving them canted ends for external appearance, which would be better

really than the perspective suggests, with its turnip-field trees. "Ghost" has a nice plan of the elementary school type, with the entrance at one end of the central hall; but he has put the masters' rooms on the first floor, away from all supervision, and gives us narrow corridors which we do not much like. The elevations are above the average, and are really well drawn, though the perspective sketch is poor. "Yew Tree" is not so successful, and his head-master's room is very small; but the cloakroom is much more the sort of thing needed. The landing upstairs is shockingly wasteful, and the physical laboratory is correspondingly small. This contributor ought to do better, and he draws feelingly. Let him omit trumpery eye-slits for windows in the roofs. "Old Mereer" has notions, and adopts simple detail, which is an advantage. His canted porches are lumpy in their proportions, and ugly. The life classroom on the ground-floor room taking its position in a line with the ordinary classrooms is a mistake—would be a long way off the other art-room upstairs. There are two staircases, and a good covered playground. The view is mechanically delineated. "Plumbob" shows a regulation type of board school building in style, and the hall is on the first floor, with a central staircase, top-lighted, and the laboratories on the ground floor. The perspective is not attractive. "D'Artagnan" has an arcaded hall, with a staircase rising up out of one end without much idea of contrivance; while in the middle of one side is an entrance to the "grounds" flanked by masters' rooms, without any cloakroom convenience. The boys' cloakroom is at one end of the school and their lavatory at the other. "Regent" has a fairly good rear elevation, with an arcaded playing shelter, but the detail is poor, and the plan is crude. "The Magpie" goes in for coarse features and heavy masonry, better adapted to bridge building. The plans are ordinary, having a central hall with galleries all round. "Norseman" has a better plan than elevation. He has taken some pains to furnish his laboratories, but omits the classroom seatings and fireplaces. "The New Boy" takes a lot of trouble, but is not simple enough, going in too much for octagonal-shaped classrooms and bay's and splay-arranged doors. His south-east front is pretty, and might do for a vicarage. "Orehid" is next in the list with a cloakroom put in place of a classroom out of the assembly-hall, which runs up through both floors. The building is not well adapted to a school. "Architect" will never deserve the name if he does not do better than his present design. The plan is disconnected and broken into by a big staircase out of the central hall. The front porch is mere pettifoggery work. "Adze's" hall is upstairs, with one laboratory down below and the other above. The cross-passages on the ground floor are very dark and bad. "Frena" has one staircase and an open-timbered roof to his assembly-hall. There are good points in his plan, but the contrivance is very mixed, as in the last named. "Liver" is an indifferent penman, with little notion of school-planning. The front elevation is picturesque. "Leo" has two square-topped six-sided towers, giving a church-like character to a poorly-planned school. "Blackheart" draws in a thin fashion, and has sprawling, segmental-arched windows, divided by buttresses. He makes a feature of an emergency exit. All is on the ground floor except the art-rooms. The masters' rooms are mere boxes. We cannot find space to particularise more of the designs in detail, as they are so numerous and so indifferent. They come in this order:—"Fenland," "Broad Arrow," "Pip," Southampton; "Tender Foot," "Ydol," "Black and White," "Wee Macgregor," "Inside Right," "Cast," "Pip," "S. H. S.," "Free Trade," "Cedric," "Clerk of Works," "Cave Canem," "Chin Chin," "Sandy," "Inca," "Marcus," "Quail," "An Old Scholar," "Puck," "Young Michael," "St. Nicholas," "Eurymedon," "Jap," "B.," "Putre Sens," "O. K.," Musselburgh; "Obelisk," "Zorcolo," "Criss Cross," "Fido," "Arabi Tang," "Sir Toby," "Humber," "Specs," "Quatre Vois" (unfinished), "White Rose," "Midnight Oil," "Autocar," "Primus," "Omega," "Cleddady.".

The foundation-stone of a new school for St. Saviour's, Norwich, was laid on Friday by the Bishop of Norwich.

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ILLUSTRATIONS.

NEW OFFICES OF THE OCEAN AND GUARANTEE CORPORATION, LTD., BELFAST.—"THE RESURRECTION OF THE DEAD," WEST FRONT, WELLS CATHEDRAL.—DALE SIDE, HARROGATE.—ST. GERMER (OISE).—"BUILDING NEWS" CLUB DESIGNS FOR A SECONDARY SCHOOL.

Our Illustrations.

NEW OFFICES OF THE OCEAN ACCIDENT AND GUARANTEE CORPORATION, LTD., BELFAST.

The new buildings erected in Belfast for the Ocean Accident and Guarantee Corporation, Ltd., Moorgate-street, E.C., are situated at the junction of Donegall-square East and Chichester-street, facing the city hall. Emphasis is given to the principal angle by the tower which rises to the height of 125ft. The work externally is of red sandstone from Ballochmyle, Ayrshire, with red tiled roofs. At the main entrance is a boldly projecting balcony carried on fan groining. Coonemra green marble is used for the columns at doorway, and the arch above is enriched with carving, including life-sized heads of the King, Queen, and late Queen Victoria. On the Chichester-street front is placed a canopy with the name of the corporation in bronze letters. A large safe deposit constructed by the Ratner Safe Company, Ltd., Moorgate-street, E.C., occupies the main basement, and can only be approached through the offices, which are fitted up in mahogany with large chimneypieces of Bath stone. This is the first safe deposit built by the Ratner Co. in Ireland, and is of the most up-to-date construction. The outer shell is composed of drill-proof compo. steel, constructed in the strongest possible manner. The doors are of the most improved construction, composed of metal at once undrillable and unbreakable, whilst the bolt work and locks of the doors are of the highest class. In addition to the offices of the Ocean Corporation are several shops, and the remaining floors of the building are let out in offices approached by marble-lined vestibule with stone staircase and electric lift. Messrs. Robt. Corry, Ltd., are the contractors, and the architects are Messrs. Young and MacKenzie, Belfast.

"THE RESURRECTION OF THE DEAD," WELLS CATHEDRAL.

The west front of this grand church was designed, like that of Lincoln and Salisbury cathedrals, with the intention of providing a field on which to display a grand scheme of figure sculpture. Bishop Jocelyn commenced the Wells façade on his return to England in 1218, and his evident purpose was to throng the whole front with statues; but in doing this he avoided all imitation of the great portals of Paris, Rheims, and Amiens, then in course of erection. The west door at Wells is, relatively speaking, exceptionally small, even among English cathedrals, and it was so contrived in order that it should not interfere with the sculpture scheme. The great north porch forms the main entrance to the cathedral, and this western portal gave access to the burial ground in front of the building. The sculptures which we illustrate to-day are situated high up, as a sort of frieze, ranging in niches above the recessed windows

and tiers of statues with which the façade is covered, and the returns are furnished by the divisional piers, or buttresses, which constitute such an important feature in the design of this exquisite building. The figures are shown bursting from their graves to life eternal on the summits of the Judge of All, who in Majesty is represented in the crowning group of sculpture which occupies the central gable above. The undraped figure-work of the 13th century sculptors contrasts in a marked degree with the delicate suggestions of human anatomy which distinguish the draped statues of this front as elsewhere. The crude shapings of these nude figures is very noticeable, though their action is spirited and dramatic. Many of them are dignified, and an exceedingly difficult problem has been realised in a grand way, which at the same time tells its own tale without hesitation and without encroaching upon the architectural lines of the recesses which inclose these carvings. Even where the coffin lids are introduced, they are handled with much skill and simplicity. Being situated a great distance from the ground, the breadth of the treatment of these groups is of immense value, and the effect, of course, is very different from that obtained by the close examination which photographs taken from a scaffold render possible. These sculptures are among the earliest of their kind in England, and certainly are among the best which we have to show of detached figure carvings leading up to the statues which in all probability were subsequently added as the work proceeded. The date of this work is given as 1220 to 1230; but some of the figures possibly are later.

DALE SIDE, HARROGATE.

These interiors are from a recently-erected house at Harrogate, designed by Mr. F. Rowntree, architect. The exterior is picturesquely treated, and a feature is made of the hall out of which the staircase rises. The lower picture on our plate shows this apartment, and the upper photograph illustrates the boudoir, which has a basket grate to the fireplace with doors or shutters to regulate the draught.

CHURCH OF ST. GERMER (OISE).

I SEND photos of the north and south aisles of the church at St. Germer (Oise), in which William the Conqueror swore to hold England as a fief of the French crown if he succeeded in conquering it. They are interesting architecturally and historically.

Paris. H. HALLIDAY SPARLING.

"BUILDING NEWS" DESIGNING CLUB: A SECONDARY SCHOOL.

(For description and awards see page 683.)

CHIPS.

The next meeting of the Auctioneers' Institute will be held at Hamilton House, Victoria Embankment, on Wednesday next. Mr. W. F. Webster, M.A., will read a paper upon "Particulars and Conditions of Sale." The chair will be taken by the president, Mr. J. H. Townsend Green.

Major C. E. Norton, R.E., held an inquiry at Todmorden Town-hall on Thursday in last week with reference to the application of the corporation for permission to borrow £27,274 to meet the cost of providing a refuse destructor, an electric lighting station, &c.

The inauguration of the new waterworks for Southborough, Kent, which are situated at Upper Haysden, and by which it is estimated the local yield will be increased to 120,000 gallons per day, took place on Thursday in last week. The total cost of the works is approximately £18,000.

The inauguration of trams on the London-road, Brighton, and the transfer of the terminus in front of the north gate of the Pavilion to the Old Steine, close to the Aquarium, took place last week.

The men's lodging-house erected on the Mill-lane Estate, Deptford, is reported by the Housing Committee of the County Council to be practically complete. It is to be opened to-morrow (Saturday) by Countess Carrington, and will be known as Carrington House.

Messrs. J. B. Joyce and Co., Whitchurch, Shropshire, have just completed the fixing of a large striking clock with three illuminated dials at Wootton Hall, near Ashbourne, Derbyshire, for the Hon. Henry Bourke. The same firm have also fixed an extra large quarter clock at Stobhill Hospital, Glasgow, which shows time upon four illuminated dials, 1ft. diameter. They are made to designs laid down by Lord Grimthorpe.

COMPETITIONS.

ACTON.—The county council of Middlesex invited the following architects to submit designs for their county school at Acton—viz., Messrs. Maurice B. Adams, Felix Clay, B.A., Giles, Gough and Trollope, Pratt, W. Pywell, Osborne Smith, and A. H. Tiltman. Mr. Leonard Stokes acted as referee, and the governors have adopted his report, by which Mr. Tiltman's design was chosen for execution, and the premiums awarded were given to Mr. W. Pywell, of Hanwell, and Messrs. Giles Gough and Trollope, of Charing Cross. The cost was set down at £8,000 in the instructions as a basis, but the requirements were in excess of that amount.

BRIGHTON AND HOVE HOSPITAL FOR WOMEN.—There are upwards of 60 sets of designs sent in for this competition, and it is expected the adjudication will proceed at once.

NEW HOSPITAL FOR AYR DISTRICT ASYLUM.—The Ayr District Lunacy Board have now selected a design for carrying out the proposed new hospital at their asylum. Twenty designs were submitted for the work, and were reported upon by Mr. Sydney Mitchell, architect, Edinburgh, as assessor. The board offered three prizes of £75, £50, and £25. The assessor placed the designs as follows: First prize, Mr. John Arthur, 131, West Regent-street, Glasgow; second prize, Mr. J. K. Hunter, architect, Ayr; third prize, Mr. John B. Wilson, 92, Bath-street, Glasgow. After considering the designs in view of the measurer's report, the board have selected the design presented by Mr. John B. Wilson, which, it will be seen, was placed third by the assessor.

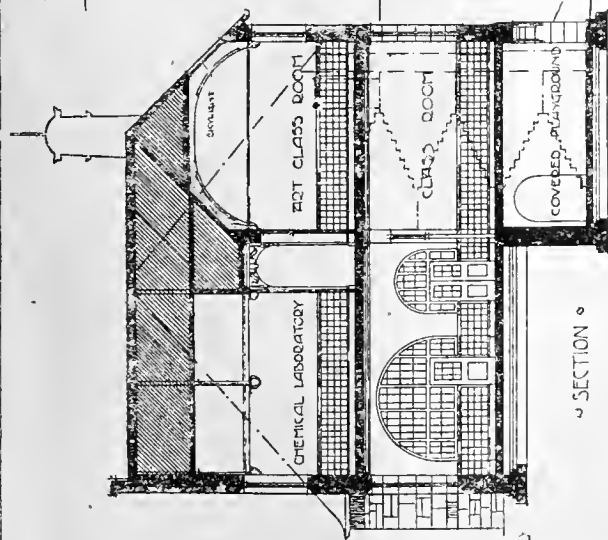
RAWNSTALL.—Twenty-nine designs have been received for the "Carnegie" Library at Rawntall, and they are said to be on the whole above the average in merit. Messrs. Butterworth and Duncan, architects, of Rochdale, have been appointed assessors. The premiums are £100, £50, and £30 respectively for the three designs placed for premiums. The plans are to be on view on the 20th and 21st at the Liberal Club, Rawntall.

ST. ANNE'S-ON-THE-SEA — PROPOSED FREE LIBRARY.—At a meeting of the General Purposes Committee of the St. Ann's Urban District Council, the clerk reported that the sites sub-committee had had under consideration the question of the erection of the Carnegie free public library and of public baths. With regard to the latter the sub-committee had not as yet completed their inquiries; but as regards the former they recommended that competitive designs be invited from local architects, and that premiums of £20, £10, and £5 be offered for the best designs sent in. They further recommended that the author of the selected design carry out the works at an inclusive fee of 7 per cent. (the amount of the premium to merge into and form part of the commission) on the cost, the fee to include the preparation of plans, sections, estimates, the measuring up of the work, getting out quantities, and all other work in connection therewith. According to a report to hand, the committee further recommended:—"No commission of any kind is to be received by the architect from the contractors, or any of them," and the library outlay, including furnishing, architect's commission, and all other costs and expenses in connection therewith, is not to exceed the sum of £3,500. It is difficult to believe that such an insulting stipulation as that italicised by us could be made by any responsible public body, and we trust "the local architects" invited to compete will combine and insist that the clause is expunged from the conditions before consenting to compete.

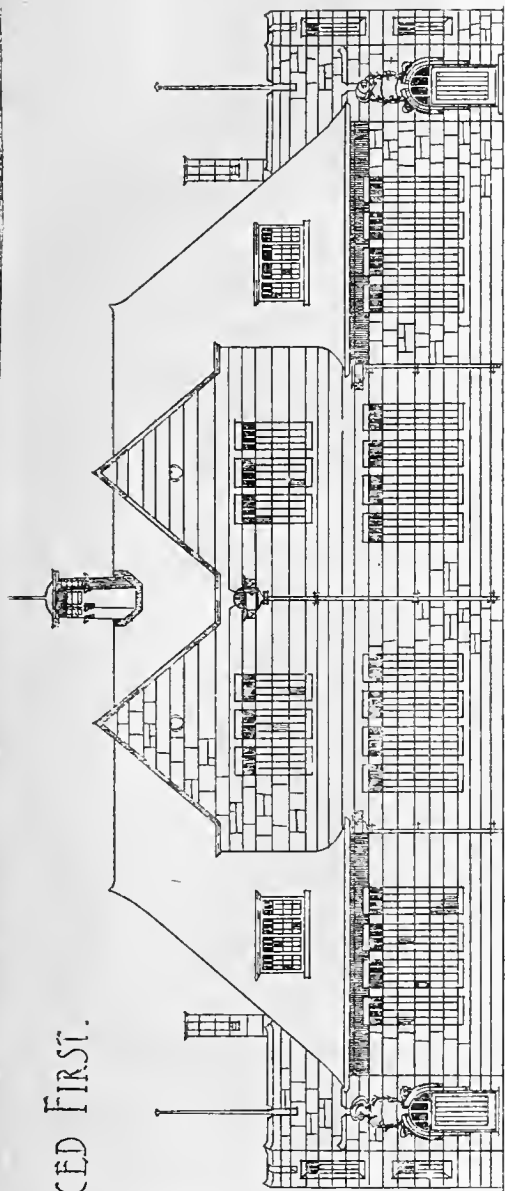
THE NEW TOWN HALL FOR STOCKPORT.—The Town Hall Committee of the Stockport Corporation on Wednesday received the report of the assessor appointed to award the premiums offered for plans for a new town hall and municipal buildings. The awards were as follows:—1, £100, Mr. A. Bramwell Thomas, London; 2, £75, Messrs. Woodhouse and Willoughby, Manchester; 3, £50, Mr. H. T. Hare, London; 4, £50, Mr. C. R. Locke, Stockport; 5, £50, Messrs. Briggs and Wolstenholme, Liverpool. The Committee fixed the limit of cost at £60,000.

The Bishop of London dedicated, on Wednesday, the new church of St. Martin's, West Acton, which has been erected on a site given by Mr. J. Reaud, M.P. and accommodates 500 persons.

PLACED FIRST.

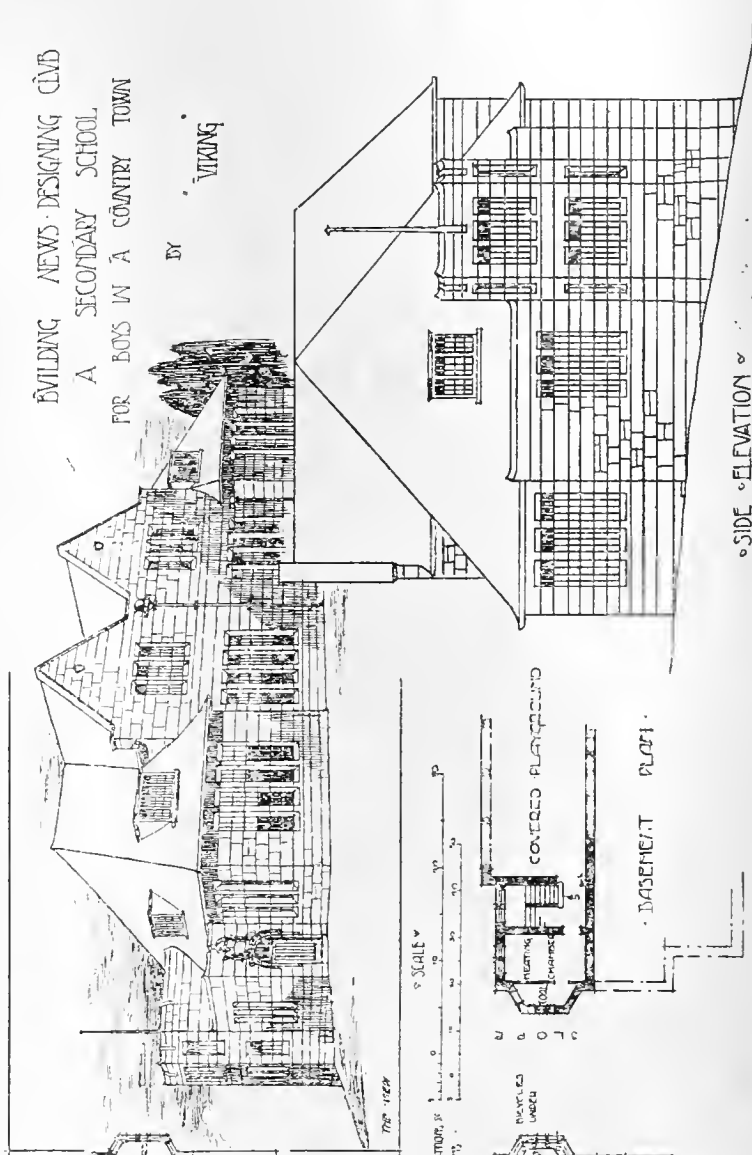


SECTION

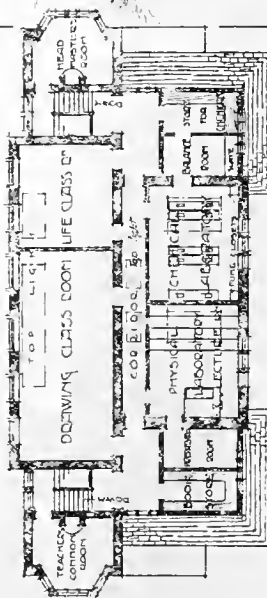


FRONT ELEVATION

BUILDING NEWS DESIGNING CIVIL
A SECONDARY SCHOOL
FOR BOYS IN A COUNTRY TOWN
BY
VIRKING

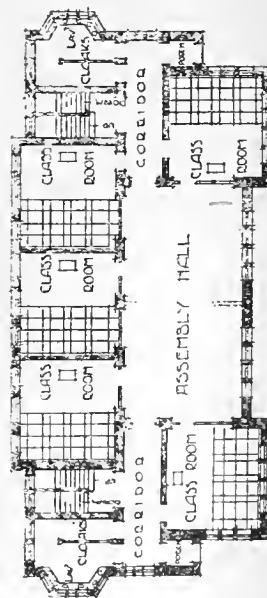


SIDE ELEVATION

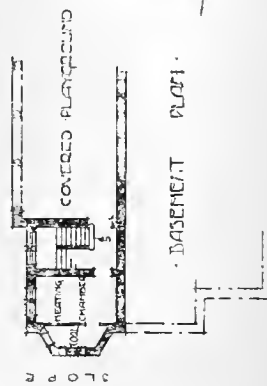


FIRST FLOOR PLAN

UNIFORMS & AT CLOSET



GROUND PLAN



BASEMENT PLAN



COVERED PLAYGROUND

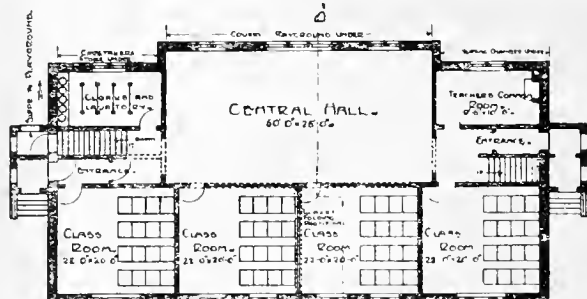
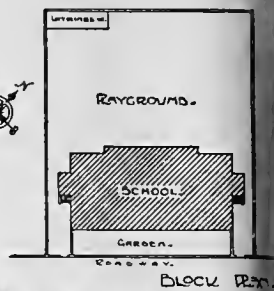
B.N.D.C.

A SECONDARY SCHOOL

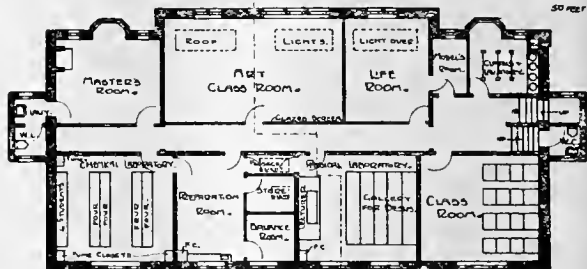
FOR 150 BOYS

DESIGN BY "NOVOCASTRIA"

PLACED THIRD

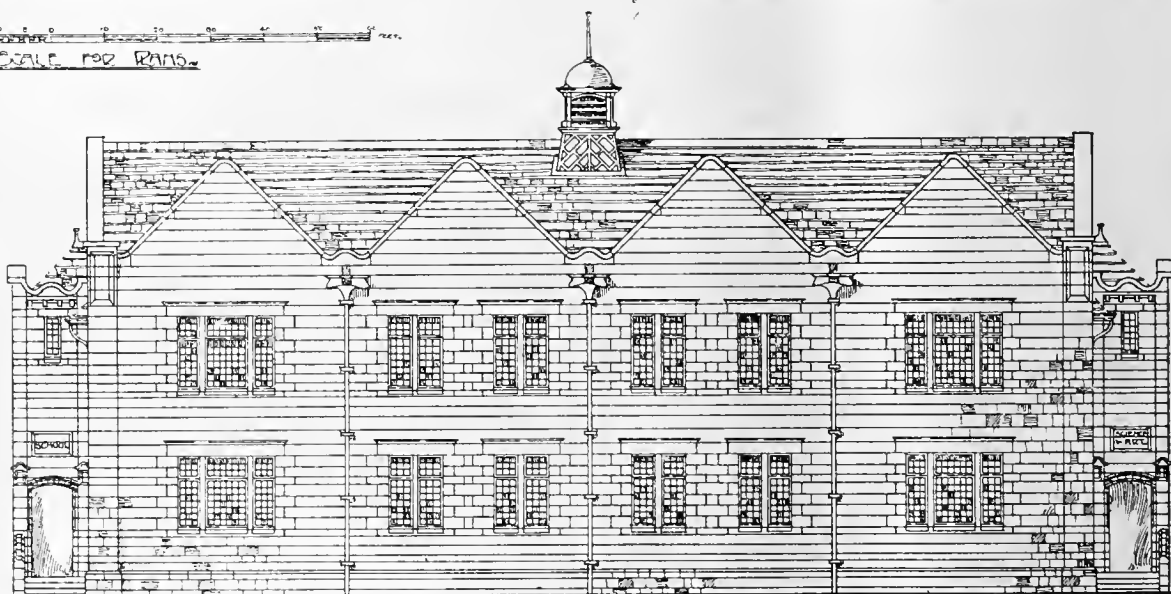


GROUND FLOOR PLAN



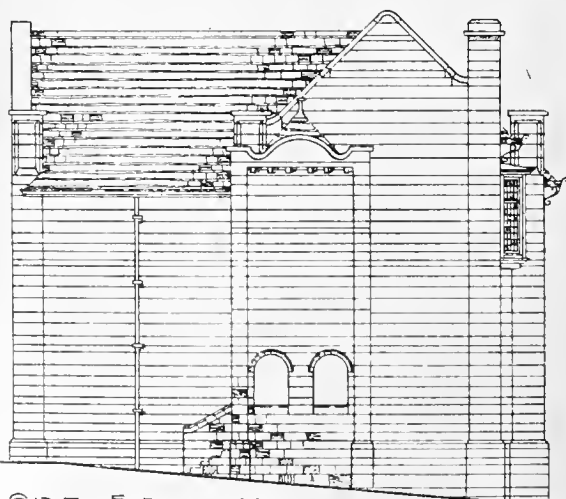
FIRST FLOOR PLAN

SCALE FOR PLANS

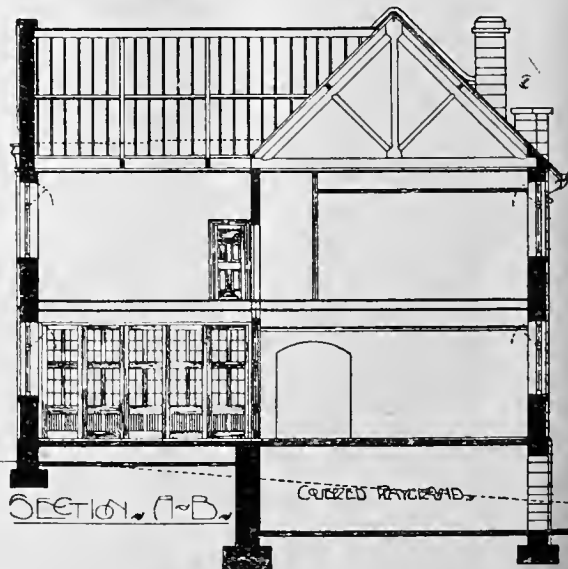


FRONT ELEVATION

SCALE FOR ELEVATIONS & SECTION



SIDE ELEVATION



SECTION A-B

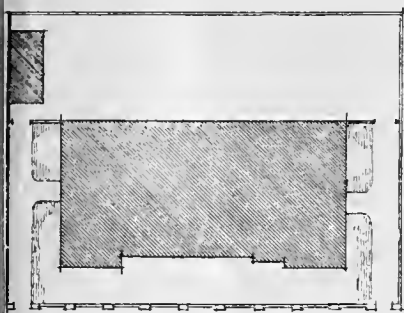
PLACED SECOND.

B. N. D. C.
DESIGN
FOR A
SECONDARY
SCHOOL
FOR 150

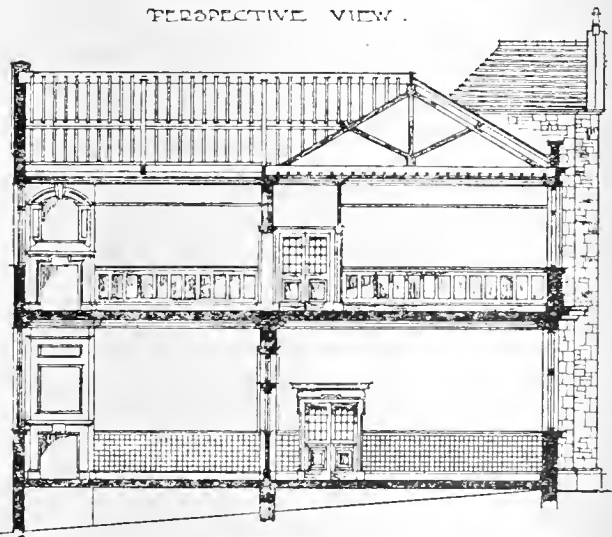
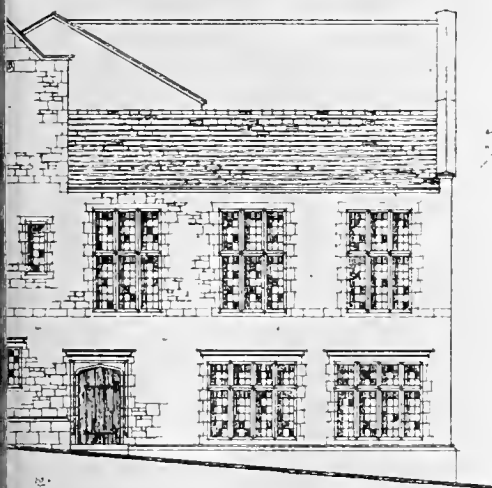
BOYS
BY
"ILEX"



PERSPECTIVE VIEW.



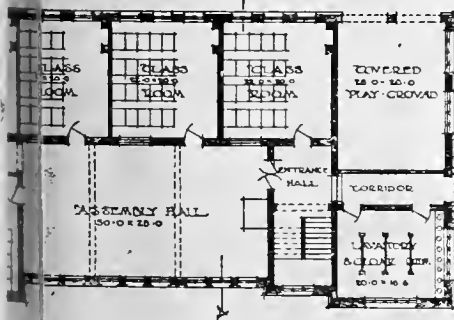
BLOCK PLAN



SECTION AA.



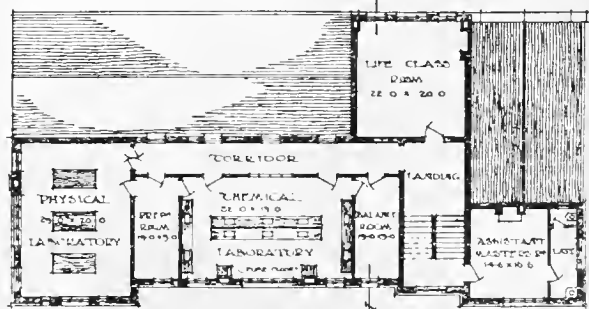
FRONT ELEVATION



GROUND FLOOR PLAN



MEZZANINE PLAN



FIRST FLOOR PLAN

LONDON TRAFFIC COMMISSION.

THE Royal Commission on London Locomotion again sat at the Westminster Palace Hotel on Thursday, Sir David Barbour presiding. Mr. Andrew Young, valuer to the London County Council since 1899, and before that valuer and surveyor to the London School Board, gave further evidence on behalf of the London County Council. He believed that the only economical method of carrying out street improvements in London was by laying out the projected new streets in such a way that it would not be necessary to acquire a large proportion of valuable property occupied for business purposes, but where practicable they should be carried through property of an inferior class where the formation of a broad thoroughfare would not only be possible at much less cost for property, but would by facilitating ventilation and opening up the district improve the condition of it from a sanitary point of view. A proposal under consideration was the construction of streets at a greater width than any hitherto projected in London—namely, 160ft. which must involve outlays of great magnitude. The effect of any such construction would have the effect of generally and enormously raising the value of property in the remoter districts, which it would bring more closely into touch with Central London. If the proposal were further extended so that there should be special means of locomotion by surface tramways, motor, and other fast traffic, and by tube railways, the possibilities for recoupment would not only be increased but would extend over large areas of these remoter districts. The approximate estimated cost of the proposed new thoroughfare in continuation of the Holborn to Strand improvement—across the Thames, through Southwark, Bermondsey, and Camberwell, to the Crystal Palace was twelve millions. The line of route was 6½ miles in length, and he had included an area of land 150ft. deep on either side of the proposed thoroughfare. A considerable portion of the £12,000,000 would be recovered by the sale of the surplus property. As Parliament required that fresh house accommodation should be provided, the difficulty of carrying out such a scheme would be greatly enhanced, and more than 41,000 persons would be displaced. To provide accommodation for these would necessitate the acquisition of a site or sites of over 200 acres. Any such new streets should as far as possible take the form of new thoroughfares, and not merely widenings. Mr. Young next gave figures as to the cost of the Holborn-to-Strand improvement, and he was sanguine that the net cost of property for this improvement was likely to be less than the original estimate. Sir Alexander Bruce, Assistant Commissioner of Metropolitan Police, gave evidence on Thursday and Friday. He said that, owing to the mode of growth of London, there was an absence of plan in the construction and arrangement of streets, and no adequate provision had been made for growing needs. With a few notable exceptions the streets were as narrow and irregular now as they were 100 years ago, while the traffic had increased at an enormous rate, especially during the last quarter of a century. For the obstruction caused to traffic by the breaking up of roads, there seemed to be but one effective remedy—that of providing subways carrying all pipes, sewers, &c., so that they could be got at without interfering with the surface of the roads. With respect to tramways, he considered that tramway routes and termini had not always been fixed with due regard to the convenience of the public. One remedy for such a state of things was to have the termini in by-streets; and another was that the tramway should, instead of stopping as it did now, go off at some by-street, form a loop, put down its passengers, and then come on to the main line. From a public point of view, the chief hindrance to a steady flow of traffic was cross traffic. So long as a street had other streets running into it, carrying cross traffic, there must be frequent compulsory stoppages, and resulting annoyance and delay. Subways or bridges might be provided for pedestrians; but it was not easy to see how this could be done in the case of vehicles. It was for engineers to say whether or not it was possible. The commission adjourned.

Mr. Bertram Hopkinson, of Trinity College, was on Saturday elected Professor of Mechanism and Applied Mechanics at Cambridge University, in the place of Mr. J. A. Ewing, resigned. The new professor is a son of the late Dr. John Hopkinson, and the stipend is £700 a year.

OBITUARY.

THE death occurred on Monday, at Vienna, of Herr KAMILLO SITTE, a prominent architect and writer on art topics, in his sixtieth year. He was the author of the work entitled "The Construction of Cities upon Artistic Lines," which has recently been translated into French and English.

PROFESSIONAL AND TRADE SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—A visit by members of this association was paid on Saturday afternoon to the New Nurses' Home in connection with Cork-street Hospital, Dublin. Good muster of members turned up for the occasion, including Mr. C. H. Ashworth, the president, and Mr. J. H. Webb, the hon. sec. of the visits committee. The visitors were received by the architect to the building, Mr. W. M. Mitchell, R.H.A., who having exhibited the drawings and made a brief explanatory statement, afterwards conducted them through it, pointing out the various objects of interest therein. The new home is very advantageously situated opposite the Hospital, with Cork-street intervening. The main front enjoys a sunny aspect overlooking a lawn of considerable extent bordered by trees which was formerly used as the burying ground of the Society of Friends. No internments, however, have taken place there for nearly half a century, and it will shortly be transformed into a verdant garden for the rest and refreshment of the inmates after their arduous duties at the hospital. Accommodation is provided in the building for about fifty nurses, each having a separate bedroom, while large airy dayrooms occupy the ground story. The floors, partitions, &c., are fireproof throughout, and an external wrought-iron staircase is provided for emergencies. The entire building is heated by hot water, and electric lighting has been adopted. The sanitary wing, which is connected with the main building only by a corridor having cross-ventilation, is fitted with the most approved type of baths, lavatory basins, &c. The building and sanitary contractors respectively are Messrs. H. and J. Martin and Mr. R. MacGarvey, both of whom have given great satisfaction, while Mr. Hynes, the clerk of works, efficiently discharged the duties of his office.

THE EDINBURGH ARCHITECTURAL ASSOCIATION: ASSOCIATES' SECTION.—This association met on the 11th inst. at 117, George-street, Mr. J. A. Arnott in the chair. Mr. Ramsay Traquair delivered a lecture on "Notes on Later Scottish Gothic." The lecturer traced shortly the rise and progress of Gothic work in Scotland, pointing out the manner in which the earlier English style was replaced by a mixed school influenced both from France and England. Great stress was laid on the need of studying the simpler examples of the earlier style as a base on which to raise new ideas. A number of characteristic buildings of the "Later Decorated" period were described. The paper was illustrated by lantern slides.

MANCHESTER SOCIETY OF ARCHITECTS.—On November 12, Mr. Alfred E. Corbett, A.R.I.B.A., read a paper on "Modern Domestic Architecture." Mr. Corbett said that the advance during recent years in the art of architecture had been greatest in domestic work, and had been largely influenced by the feeling that modern architecture must be founded more on sound and straightforward construction, and the suitable treatment of materials, than on the forms of buildings erected to fulfil the requirements of some bygone century; although careful study of these old buildings is a necessity to every architect. Noting various points as to the choice of materials and methods of construction, stress was laid on the advantages of solid construction of floors, &c., and detail given of some varieties of solid concrete or wooden floors. A double cavity wall was mentioned as probably having some advantages. Speaking of various treatments of wall surfaces, half-timber work, when used merely as a casing in front of a brick wall, was condemned as being a useless, and more or less perishable, deception. The aspect and planning of the chief rooms, and of the house as a whole, were briefly commented on, and illustrated by examples of plans by Mr. Norman Shaw and others. Referring to the external treatment it was insisted that the scheme must be mentally realised as a combination of materials of certain colours and textures, not merely as a pleasing arrangement of lines on paper; and that local material should generally be preferred. While

moulded brick is a useful material, terracotta was thought to be quite unsuitable for country houses. The remainder of the paper consisted of comments on lantern slides, showing over fifty views and plans of good modern domestic work by leading architects. After a few words by Mr. J. W. Beaumont, the president, a vote of thanks to the lecturer was proposed by Mr. W. A. Royle, and seconded by Mr. J. S. Hodgson. At the same meeting the names of the following prize winners were announced:—For the best work in the R.I.B.A. classes: First year course, Mr. R. J. Vernon, prize value £4 4s.; second year course, Mr. Sidney Moss, prize value £1 4s. For the best work in the evening classes of design: Mr. H. B. Laycock, prize value £4 4s. Mr. Beaumont's prize, value £5 5s., for measured drawings for the sketch-book: Mr. Claude Paterson. Set of sketches in connection with summer visits: First prize, value £3 3s., Mr. Frank Dyer; second prize, value £1 1s., Mr. J. H. Somerset. Measured drawings of old work: First prize, value £3 3s., Mr. J. H. Somerset; second prize, value £1 1s., Mr. R. J. Vernon. Commentary on map of interesting buildings of the neighbourhood: Prize value £1 1s., Mr. Spencer H. Oldham. Design for window and balcony: Prize value 10s. 6d., Mr. C. Norman Taylor.

NORTHERN ARCHITECTURAL ASSOCIATION.—The opening meeting of the winter session of this association was held on Friday at the offices in Northumberland-street, Newcastle, the President, Mr. J. Walton Taylor, F.R.I.B.A., in the chair. The trust deed for the gift of £1,500 to the association by Mr. W. Glover, F.R.I.B.A., of Windsor, an ex-president of the association, and formerly of Newcastle, was read. Ald. W. H. Dunn was elected as an honorary member of the association in recognition of past services, and thanks were expressed to Mr. H. C. Charlewood, F.R.I.B.A., for presenting to the library a copy of "Wymondham Church, Norfolk." The president, in his inaugural address, referred to Mr. Glover's gift, and then went on to speak of the year's progress in buildings, and showed a set of plans, the original ones of Mr. Richard Grainger, for laying out the central part of Newcastle. Speaking of the development of the suburbs, and referring to the Bourneville and Port Sunlight schemes, Mr. Walton Taylor said in his opinion the Corporation of Newcastle were acting wisely in erecting two-story dwellings in tenements on the line of the electric tramroads so that those who used to live at a cheap rate could do so, and readily remove from one shippard or works to another. Besides, the facilities for travelling in workmen's cars were so great that there should not be any difficulty in men getting quickly to their work in any weather. In fact, the quick and frequent electric tram and train service promised to be the solution to a great extent of the housing problem. For those who would not remove from the slum he would suggest the course adopted by the Borough of Camberwell, where the Borough Council bought the houses and adapted them into healthy tenements—an experiment which had raised the standard of house accommodation, and which had been a great success, being entirely self-supporting and not costing the ratepayers a penny.

A second Local Government Board inquiry into the application of the Maidstone Town Council for a loan for the treatment of the sewage of the town by the bacteriological system was held at the town-hall on Friday, the proceedings occupying upwards of six hours. The inquiry was conducted by Mr. H. R. Hooper, M.A., M.I.C.E., and the council sought permission to raise a total loan of £78,000, spread over the longest possible period. Mr. George R. Strachan, M.I.C.E., the engineer consulted by the corporation, explained the proposals, to which considerable opposition was offered on behalf of the Marling Rural Council (who called Professor Henry Robinson, M.I.C.E.) and local landowners.

At the inquest, on Monday, on the labourer, Oram Parsons, killed in a lift accident at the Savoy Hotel extension, evidence was given by Mr. A. C. Baird, mechanical engineer, in the service of the London County Council, that the lift rope was deteriorated and in poor condition. The jury, in returning a verdict of Accidental Death, stated that the rope, which broke, was not properly examined by qualified persons.

The annual distribution of prizes at the City Companies' Trades Training School in Great Titchfield-street, W., will take place on Wednesday, Dec. 9. The prizes will be presented by the Right Hon. Lord George Hamilton, M.P.

Building Intelligence.

EXETER.—The first section of the new electricity station at the Basin was opened by the Mayor on Monday. In March the city will be entirely supplied from the new station, and everything now done in the works in New North-road will be transferred to the Basin works. The new station has cost altogether £14,000. The contractors are Messrs. W. Brealy and Son, St. Thomas, Exeter, and the architect is Mr. D. Cameron, of Messrs. Cameron, Commis, and Martin. The engine-room is 105ft. by 45ft., and height 50ft. The room has a face of glaze bricks of French grey, with chocolate dado. There are engine-rooms, boiler-room, coal-stores, repairing shops, offices, economising chamber, pump-rooms, lavatories, &c. The electric installation is by the British Westinghouse Company, and the sub-contractors are Messrs. Babcock and Wilcocks and Messrs. Willey and Co. The architect has been represented at the works by Mr. H. W. Bulley; the clerk of works is Mr. F. Smith. On the chief front are two life-size figures representing Science and Art, and also a panel containing the arms of the city; these have been carried out by Mr. E. T. Rogers, of Sidwell-street, Exeter.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of this body, the Highways Committee submitted an amended scheme in reference to the acquisition of the undertaking of the London Southern Tramways Company, involving an estimated net outlay of £375,000. In the course of a discussion, Lord Welby urged caution before the Council committed itself to further large expenditure. The committee's recommendations were ultimately adopted. It was agreed to abandon the following four projected tramway schemes on account of the refusal of the local authorities to contribute to the necessary street widenings—viz., Hop Exchange corner to Lambeth Palace-road, Shepherd's Bush-road to a point near the Marble-arch, Battersea-park-road to King's-road, Chelsea, and Tooting High-street to the new county boundary. On the recommendations of the Highways Committee it was agreed that for the purpose of the early reconstruction for the conduit system of electrical traction of the first 22½ miles of the Council's northern tramways and for lines in the south, tenders be invited for 12,500 tons of rails, conductor tees, fastenings, &c., at an estimated cost of £90,000. An estimate of £13,850 for the purpose of constructing new termini at Tooting was agreed to.

LUTON.—The opening of the Bury Park Congregational Church, Luton, Beds, took place on Thursday afternoon last. The building is designed in Perpendicular Gothic, freely treated. A bold square tower forms a prominent feature at the corner of the block. The accommodation provided is as follows: 468 adults on ground floor, and 65 in end gallery—total 533, or a mixed congregation of about 610 persons. The buildings to be faced with red brick, with Bath stone dressings. Joinery internally stained transparent green, and wax-polished. Red granite columns supporting four crossing arches. Lead-lights richly coloured. Green slates. Heating by low-pressure pipe apparatus, and the best ventilating appliances. The contract is let to Messrs. T. and E. Neville, of Luton, and amounts to £4,429. The architects are Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, London, W.C.

Under pressure from the Board of Trade, the Acton Urban District Council appointed, on Monday, Mr. W. H. Trentham their electrical engineer for three years. The council decided upon the use of steam for the generation of electricity, and referred to Mr. Trentham the desirability of having a combined scheme of electric lighting and dust destructor works, the Local Government Board having already given their sanction to a site for the latter at Bedford Park. The expenditure involved is estimated to exceed £100,000.

Mr. Samuel Henry Turtle, of Messrs. Turtle and Wood, builders, St. John's-road, New Wandsworth, who died on October 20, bequeathed all his property, on the death of his mother and his brothers and sisters, for the furtherance of the Gospel of Jesus Christ, a sum not exceeding one-fourth thereof to the Battersea Chapel Sunday-school, and one-half the residue each to the Baptist Building Fund and the London Baptist Association Sites Fund. The value of the property is £53,561 9s. 5d. gross, and £50,364 19s. 4d. net.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

REMOVED.—T. A. M.—N. L. T. (Lincoln).—J. and Co.—F. A. Q.—R. M. and Son.—R. K.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"An Old Scholar," "Autocar."

Correspondence.

ARCHITECTS' SECRET COMMISSIONS.

To the Editor of the BUILDING NEWS.

SIR,—This week the profession in London has been favoured by circulars inclosing a souvenir of a billiard championship match accompanied by this offer:—"Should our large illustrated list be of service to you we shall have pleasure in sending same, and in the event of business, we should, of course, recognise the usual architect's remuneration!" The point of the whole thing is in the line which put in italics, please. I do not suppose these enterprising people thought much of the insult thus offered to honest men. The proposal is not often made, however, in such direct terms; but in other catalogues lately issued at great expense, and sent to architects, additional pocket information is furnished, showing how second discounts are obtainable, and which need

not appear on the surface from the bare statement of provisional amounts in specifications. Of course, if questioned adversely, the way of retreat is afforded by the excuse of custom in trade. Wisecracks with business heads on their shoulders, when they hear of these things, with a credulous look assure you that "Of course these things are done," in recognition, I presume, of "the usual architect's remuneration." "Not likely anyone's going to tell" of such nefarious transactions. I have known as many architects as most people; but although this subject crops up every now and again, I doubt if it obtains, at any rate in any appreciable degree, amongst recognised men. Still, I am bound to realise that these suggestions actually made indicate a style of business which is most objectionable, and any firm adopting it ought to be tabooed by all decent architects.—I am, &c., A FELLOW OF THE INSTITUTE.

THE LATE MR. A. J. BARLOW: A CORRECTION.

SIR,—Will you kindly correct an error made in your issue of Nov. 6, top third col., p. 609? You wrongly announce the death of Mr. Arthur Edward Bartlett, who is alive, and is anxious for this report to be contradicted. The name should have been Arthur Job Barlow, A.R.I.B.A.—I am, &c., W. J. LOCKE, Secretary.
9, Conduit-street, London, W., Nov. 17.

Intercommunication.

QUESTIONS.

[12023.]—**Breaking Strain.**—Can you tell me the breaking strain and safe load of steel girder 10ft. long, flange 3in. thick, 6in. between flanges? And what would be break and safe load on the flanges only?—FAIR MAIR.

[12024.]—**Rainwater.**—In what way can I store and filter rainwater from flat roof of proposed small bungalow in country district—for drinking and other purposes? Also best arrangement for closet and drainage. There are no sewers in neighbourhood.—A. B.

[12025.]—**Ancient Lights.**—In Prof. Banister Fletcher's book on "Light and Air," he says that by blocking up an adjoining owner's ancient lights for twelve months the said owner's lights are lost, even though the obstruction should be made surreptitiously, as it were, without the dominant owner's knowledge. On what authority is this based? As in cases of alleged abandonment of lights cited by the same author, it appears to have been necessary to prove intention of abandonment by the dominant owner before the lights could be lost?—LIGHT AND AIR.

[12026.]—**Baker's Oven.**—Can any reader of the BUILDING NEWS inform me how to build a baker's coal "flush oven"? Small sketch or plan and section.—BAKER.

REPLIES.

[12022.]—**Worms in Wood.**—Corrosive sublimate solution usually applied.—REGENT'S PARK.

CHIPS.

The Paviers' Company will hold an exhibition on Monday next at the Guildhall, E.C., in connection with their recent competition for essays on the question of the provision of street subways.

The Great Central Railway Company have taken definite steps towards the commencement of the erection of waggon works at Dukinfield, where they recently acquired 27 acres.

A Wesleyan church parlour was opened at Manningtree, Essex, on Wednesday week. Mr. J. W. Start, of Colchester, was the architect, and Messrs. Sage and Cutting, of Wix, were the contractors.

The parish church of Buxhall, Norfolk, was reopened last week after restoration, including the rebuilding of the porch and repairs to the nave. Messrs. Rattee and Kett, of Cambridge, were the builders.

The Teimouth Urban Council have completed negotiations for acquiring part of the well-wooded grounds of Bitton House as a public pleasure ground. The mansion stands between a main street and the River Teign, not far from West Teignmouth Church and a little above the quay, and a portion of the estate has been built over.

A new Wesleyan Church at Talbot-lane, Rotherham, which has been built on the site of the old chapel burnt down in November, 1901, was opened on Friday. The new church is the third place of worship on the same site. The first was an octagonal chapel in which John Wesley preached several times. The new building is modern Gothic in style, and will accommodate 860 worshippers. The cost has been £11,500, which includes £1,000 for the organ. The architects are Messrs. W. J. Morley and Son, of Bradford, and the contractor is Mr. Robert Snel.

WATER SUPPLY AND SANITARY MATTERS.

LITTLEHAMPTON.—The Littlehampton Urban District Council are proposing to carry out a gravitation, bacterial, and pumping system of sewerage for the northern portion of the town, also for the district of Wick. The works are estimated to cost £10,318, towards which his Grace the Duke of Norfolk has proposed to make a contribution of £3,000. A scheme is under preparation for these works by the council's surveyor, Mr. H. Howard.

LEGAL INTELLIGENCE.

EXTRAS ON BUILDING CONTRACTS.—In the Appellate Court, Glasgow, on Friday, Sheriff Guthrie gave judgment in an appeal against the decision of Sheriff-Substitute Balfour in an action at the instance of Messrs. William Shaw and Son, contractors, 94, Commerce-street, Glasgow, against Messrs. Ferguson and Forrester, Ltd., 36, Buchanan-street, Glasgow. Pursuers contracted with defenders to carry out alterations upon the underground portion of defenders' premises for £4,746 12s. 3d. While the work was in progress pursuers encountered unlooked-for difficulties. These difficulties increased the cost of alterations to £7,821 3s. 11d., and it was for the difference between this sum and the sum contracted for that pursuers sued. Sheriff Balfour gave judgment in favour of the pursuers to the amount of the sum sued for, holding that, though the work executed was not all included in the estimate, it largely consisted of extras, ordered either by defenders or by Mr. George Bell, architect. Sheriff Guthrie has adhered to this decision. In a note, his Lordship says it might not perhaps be wise in all cases for owners of property to put themselves entirely into the hands of their architect; but if they did so they had themselves to blame, and if the architect exceeded his powers in dealing with contractors who had been allowed, as in this case, to suppose that his powers were unlimited, the remedy was against him, and not against the innocent contractor.

CLAIM BY A SOUTHAMPTON MODELLER.—Michael Gargano, plaster manufacturer, of St. Mary's-road, Southampton, sued Messrs. T. and E. W. Jenkins, builders, of St. James-street, Newport, Isle of Wight, in the Southampton County-court, to recover the sum of £30 4s. 5d., for work done by him and materials supplied. Mr. Hiscock, for the plaintiff, stated that the claim was in respect of work done and goods supplied in the shape of modelling and making certain enrichments supplied to the defendants, who had a contract in the Isle of Wight. The sole question was that of amount, the defendants alleging that the plaintiff had grossly overcharged them. The defendants had paid the sum of £5 into Court. Frequent communications were sent to the plaintiff to get him to hurry on the work, and he sent over the goods as instructed by the carriers, and invoices accompanied each consignment. Defendants afterwards complained of overcharge. Plaintiff denied having overcharged, and ultimately offered to take £20 in settlement, but could not get that. The work that had to be done was difficult. Plaintiff gave evidence, stating that he had carried on business in Southampton for 16 years. He had to work a deal of overtime. Although he sent in invoices work kept coming in, and no complaint was made of the charges until the last work was done. Edgar William Jenkins, one of the defendants, stated that the charges were too high. Antonio Marchi, a plasterer and modeller, of Pokesdown, Bournemouth, estimated £9 12s. 8d. as the amount he would do the work for, and which would give him a fair profit. John Frank Crook, quantity surveyor and estimator, Southampton, stated that he had been connected with the building trade and work for 33 years. He was instructed by the defendants on Saturday to estimate for certain modelling work, and he gave particulars as to prices, his Honour remarking that it was very different to that of the last witness. Mr. Crook said no doubt he could have got the work done for £15, and £30 was too much. His Honour said the last witness had only seen so many foot run, and did not know the pressure put on the plaintiff by the postcards and the extra hours that had to be worked to do it. He gave judgment for the plaintiff for the amount claimed, and costs.

The town council of Lochmaben have appointed Mr. D. Balfour, C.E., senior partner of the firm of D. Balfour and Son, C.E., Newcastle-on-Tyne, as engineer for the new sewerage scheme for the burgh.

At a special meeting of the Failsforth Urban District Council Council on Monday a scheme for an extension of the sewage works was adopted, and it was decided to make application to the Local Government Board for power to borrow £11,390. The extension is in order to comply with the requirements of the Mersey and Irwell Committee and the order of the County Court.

Our Office Table.

THE Quantity Surveyors' Association has safely passed through the perils of inception, and was successfully inaugurated at a well-attended and animated meeting, held at the Holborn Restaurant on Wednesday afternoon. Mr. Hoffman Wood presided, and, while keeping members to the point, allowed the fullest discussion of all details, the meeting lasting over three-and-a-quarter hours. In the end it was decided, as will be seen by our detailed report in another column, not to restrict membership to the narrowest limits, but to welcome, at any rate for the present, all qualified quantity surveyors, whether they exclusively practise in that branch of the profession, or also act as architects. Indeed, had the line been more tightly drawn it was evident that few, if any, provincial practitioners would have been able to join. Such an association has a useful rôle to fulfil, and will inevitably raise the status of the profession by establishing a high standard of practice, and so gain for its members wider recognition from the public. It starts under excellent auspices with a membership of no less than a hundred and fifty, of whom two-thirds are in practice in the Metropolis, and it will speedily attract within its ranks all, or nearly all, the best men in the profession. We wish the movement all the success it deserves. Indeed, with Mr. Walter Lawrance as its first president, Messrs. Gate and Hoffman Wood (its originator) as vice-presidents, a small but strong committee, and Mr. F. B. Hollis, of 17, Bedford-row, as hon. secretary, its prospects for an increasing useful career are assured.

Among the applications to be made to Parliament next session is an important measure promoted by the London United Tramways Co., seeking powers to construct new lines of tramway from the High-street, Brentford, to Uxbridge-road, Ealing, another from East Bedford via Feltham to Staines, a third from Cranford along the Bath-road, Slough, and Taplow; a short line is sought to be made across new Kew Bridge, uniting the line to Kew Gardens and Richmond with the main systems of the company. The proposed lines will be laid in Brentford, Ealing, East Bedford-with-Hatton, Feltham, Stanwell, Ashford, Cranford, Harlington, Harmondsworth, Horton, Iver, Langley, Marish, Stoke Poges, Slough, Farnham Royal, Burnham, Hitcham, and Taplow. The same company is seeking powers to construct a tube railway from Hammersmith-station on the Metropolitan District system to Barnes.

THE Historical Records and Buildings Committee of the London County Council reported to that body on Tuesday that they had had under further consideration the question of indicating by means of memorial tablets houses of historical interest in London, and that they considered the following three houses worthy of commemoration—namely (1) No. 56, Devonshire-street, Portland-place, a residence of Sir J. Herschel, the astronomer; (2) No. 1, Devonshire-terrace, Portland-place, a residence of Charles Dickens; and (3) No. 12, Clarges-street, Piccadilly, a residence of Edmund Kean, the actor. They had carefully verified the facts connected with the houses in question, and had also in each case obtained the necessary consent of the ground landlords and the lessees to the erection of the memorial tablets. They accordingly recommend that the three tablets be immediately placed in position. The report was unanimously approved.

THE Housing of the Working Classes Committee of the London County Council reported at the same meeting that the housing manager had submitted to them a report of the work of his department during the year ended March 31 last. The report was satisfactory, since it showed that notwithstanding the continued increase in the rates, which now amounted to 19.46 per cent. of the outgoings, and the heavy income-tax for the year, the percentage of outgoings over the whole of the Council's dwellings was only 44.45, or 97 per cent. less than last year. The total loss by empties, including the rents lost at the opening of new dwellings, had amounted to 2.7 per cent. of the total rents receivable, and the rent written off as not recoverable amounted to only 2s. 11d. per cent. of the rent in charge, which was comparable with 10s. per cent. written off in 1901-2. The usual annual census of the Council's dwellings was taken in December, 1902, and showed that 9,480 rooms were occupied by 13,818 persons,

and the number of cases of overcrowding, which were immediately remedied, in most cases by transfer to larger tenements in the Council's dwellings, was only 15.

THOUGH not embodied in their report, published by us last week, p. 675, the treasury committee which has just reported on art matters in Scotland had under consideration the question of a site for the suggested new National Gallery. Inquiries were made as to the adaptability of the Royal High School buildings to the purposes of a National Gallery. These, it is believed, were satisfactory. The committee had before them the result of measurements made by Mr. Hippolyte J. Blane, R.S.A., of both the High School and the present National Gallery buildings at the Mound. It appears that the superficial floor space of the whole building at the Mound in which the National Gallery and the Royal Scottish Academy are housed, is 12,490ft., while the floor area of the Royal High School, with its central hall and gymnasium, amounts to 22,810super.ft., an increase of over 9,000ft. There are also at the Royal High School other buildings, which give an additional area of 2,346ft., which might be suitable for minor exhibitions, and there are possibilities of extension of the main building. The High School is a well-known Classical building, erected in 1829 from designs by Mr. Thomas Hamilton, and is now vested in the School Board.

MR. BATSFORD has just issued a second edition of Mr. J. Wright Clarke's book on "Pumps: their Principles and Construction," with 73 illustrations, redrawn for this edition, thus bringing it up to date for the use of masters, men, and students. Jack pumps, long barrel, and lift pumps, double and treble barrel pumps, water wheels, chain pumps, and bucket wheels are all dealt with, and a considerable variety of practical information is given which cannot fail to be useful, both at home and in the Colonies. The type is excellent, and the illustrations are drawn to a good size, well detailed. The price is 3s. 6d. net.

WITH the enterprise of the same publisher the same author has published a second series of "Lectures to Plumbers" (6s. net) delivered at the Polytechnic, Regent-street. The writer says his object is not to preach anything new, but to deal with details of everyday work, many of which he assures us are not thought of by most writers in plumbing, or are considered too small for notice. As a plumbing job is eminently one in which attention to detail is of the utmost consequence, no doubt Mr. Wright has done the right thing by insisting upon thoroughness in all parts of a plumber's work. He shows in a very graphic way how the old valve closets and D-trap condemned years ago, are still to be found in use contrary to all knowledge and sanitary experience, with their leaky, jointed soil-pipes and direct communication with the drinking-water supply cisterns. Having illustrated how not to do it, the lecturer shows how work ought to be done, not only with closets and baths, lavatories and sinks, but with all kinds of sockets and joints. He then deals with hydrostatics, and also with the construction of milk dairies and household laundries. Much trouble will be saved by following his advice.

THE new class of Forestry and Estate Management at the Royal Agricultural College, Cirencester, was inaugurated on Tuesday by an address delivered by Dr. W. Schlich, the newly-appointed professor. The Earl of Druce presided, and among those who took part in the proceedings was the Earl of Onslow, President of the Board of Agriculture. Dr. Schlich, in the course of his address, called attention to the growing dependence of this country upon imported timber. He adduced statistics to show that neither European countries nor the United States could be looked to for a continuous supply, as they were now exporting more than they grew, and although Canada, with proper management, might supply the needs of the world for an indefinite period, the peculiar conditions of the timber trade and the destructive forest fires precluded a too implicit reliance upon that source. He therefore strongly counselled an increase of home afforestation, and in the course of a detailed and elaborate calculation showed that, by selecting suitable species and soils, and with proper and systematic management, a return of 2½ per cent. could be obtained from forestry on land costing the following sums for planting: Oak £9 11s. per acre, beech £9 17s., Scottish pines £14 5s., sycamore £15 ls., silver fir £16 6s., ash £21, and larch £34 2s.

THE City Council of Manchester held special

meetings on Monday to obtain sanction to the promotion of three Bills in Parliament. The first is a Bill to confer on the corporation general powers for the needs of the waterworks undertaking, for the purchase of properties for street widening and improvement, for the confirmation by Parliament of arrangements between the Whitworth Institute and the corporation on the transfer of Whitworth Park to the corporation, and for the extension of the boundaries of the city, to include Withington, Droylesden, and probably Failsworth. The second Bill deals exclusively with the extension of the city tramways; and the third, which is promoted jointly by the corporation and the Ship Canal Company, to establish new financial arrangements between the corporation and the company.

CHIPS.

The St. Pancras Borough Council rescinded on Wednesday a decision come to by the previous council, and adopted by 36 votes against 20, a resolution giving statutory consent to the construction of a tramway connecting with the tramway in Hampstead-road and passing across Euston-road and along Tottenham Court-road to a point opposite the Horse Shoe Hotel. The sanction is given on the understanding that the London County Council will at once proceed to put in force the powers granted by the Council's Act of 1902, for the widening of Hampstead-road at the southern end, towards the net cost of which the borough council has agreed to contribute one-eighth.

A departmental committee appointed by the Home Secretary is now engaged in considering what amendments in the law relating to compensation for injuries to workmen are necessary or desirable, and to what classes of employment not now included in the Workmen's Compensation Acts those Acts can properly be extended, with or without modification.

The tramway system at Ipswich has been acquired by the Corporation, from a private company, and from plans by Professor Alexander W. B. Kennedy, and under the direction of Mr. E. Buckingham, borough surveyor, it has been converted from horse to electric traction, and extended in three directions—to the village of Whitton, to Bourne Bridge at the borough boundary in Stoke Hamlet, and along the Bramford-road. The Board of Trade inspection takes place to-day (Friday).

After a period of four years, owing to the late War, the competition of the stained-glass widows for the Dutch Reformed Church, Wimborg, Orange River Colony, S.A., has been shipped by Messrs. Swaine, Bourne, and Son, King Edward's-road, Birmingham.

A new wing which has been added to the Carlisle Institute, Meltham, by the founder (Mr. J. W. Carlisle), was opened on Friday by his son, Mr. W. W. Carlisle, M.P., for North Bucks. The institute was built and furnished twelve years ago at a cost of £6,000, and the necessity having arisen, the donor has had a new wing built at a cost of £2,500, exclusive of fittings, which he has also provided.

Mr. George C. Hailé, R.I., R.B.A., is about to hold an exhibition at The Modern Gallery, 175, Bond-street, W., of water-colour drawings under the title of "Venice: Colour and Sunlight." The private view is to-morrow (Saturday), and the exhibition will remain open until Christmas.

Mr. Everard Hambro has restored the little chapel of St. Catherine in the woods above his seat, Milton Abbey, Dorset. The chapel was, according to tradition, built by King Athelstan to mark his great victory at Brunanburh. It contains Saxon and Early Norman work, but since the Reformation the "chapel in the wood," as it is called, has been sadly desecrated, having been used in succession as a pigeon-house, a labourer's cottage, and a carpenter's workshop. The reopening is fixed for Wednesday next, the 25th inst, when Bishop Webb, Dean of Salisbury, will preach.

On Friday the new mission-hall, erected on Barking Tye, near Needham Market, for the Society of Friends, was opened. The hall is of red brick and cream plastered stucco wall, and covered with red Broom Hall interlocking tiles; the main room is 36ft. long by 18ft., and seats 120 persons; it has matchboarded dado and open roof. There is also a committee-room 18ft. by 9ft. The hall was built to the design of Mr. J. S. Corder, of Tower-street, Ipswich, by Mr. W. Death, of the West End Joinery Works, Ipswich.

An inquest has been held at Norwich-road relative to the death of Mr. John Downing, aged 74, of the firm of J. Downing and Sons, well-known builders and contractors, of Norwich, whose death took place under painfully sudden circumstances at his residence at City-road on Friday night. A verdict of death from natural causes was returned.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. "Industrial Decentralisation: an Important Factor in the Housing Problem," by Herbert T. Scoble. 8 p.m.

Society of Arts. "Mining of Non-Metallic Minerals," Cantor Lecture No. 1, by Bennett H. Brough. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "Distribution of Annual Rainfall in British Isles," by Dr. Hugh R. Mill. 8 p.m.

WEDNESDAY.—Society of Arts. "The Universal Exposition at St. Louis, U.S.A.," by Geo. F. Parker. 8 p.m.

Auctioneers' Institute. "Particulars and Conditions of Sale," by W. F. Webster, M.A. 8 p.m.

THURSDAY.—Builders' Benevolent Institution. Annual Dinner, Whitehall Room, Hotel Metropole. 5.30 for 6 p.m.

Sheffield Society of Architects and Surveyors. "Notes on the Study of Architectural Design," by C. M. Haddfield, F.R.I.B.A. 8 p.m.

CHIPS.

The Chapel Schools, Cavalry Barracks, York, are being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Messrs. R. Waygood and Co., Ltd., of Falmouth-road, London, S.E., inform us that they have removed their Glasgow address to 116, Hope-street, the premises of the Liverpool and London Globe Insurance Co., where three of their electric passenger lifts have been fitted.

Messrs. Percy Bacon and Brothers, of 11, New-man-street, London, W., have just placed another of their windows in Bamburgh, Northumberland. The present specimen of their art consists of two emblematical figures and St. Cecilia.

The new Savoy Hotel extensions will be equipped with 19 "Otis" electric elevators. The installation comprises five powerful passenger elevators, four luggage elevators, and ten service elevators. All are electric, with "Otis" controllers, and, with the exception of two or three smaller short rise ones, the speed of the elevators will range from 250ft. to 300ft. per minute and upwards. Regard being had to speed and lifting capacity, the hotel, as a whole when complete, will have, counting the eight "Otis" hydraulic elevators in the existing hotel buildings, probably the largest hotel elevator installation in this country.

The Lord Lieutenant and the Countess of Dudley recently visited Rathmines, Dublin, on the occasion of the opening of the new houses for the working classes, which have been erected by the urban district council of the oldest township in Ireland. Mr. F. J. Hicks was the architect, and Mr. Good the contractor.

The arbitrators, Messrs. Woodhall and Stevenson, appointed by the Gas Co. and the urban district council of Nantwich, have nominated Sir George Bruce as umpire in the scheme for the purchase by arbitration of the gasworks.

In St. Catherine's chapel at the parish church of Berkhamstead, an altar and parclose screen have just been placed. They were designed by Mr. C. H. Rew, and carried out in oak by Messrs. Harry Hems and Sons, of Exeter.

It is proposed to provide a system of electric trams for the Bishop Auckland district, and application is to be made to Parliament this month for powers for the construction of lines from Bishop Auckland to Spennymoor, to Eldon-lane, to West Auckland, and to Etherley. Messrs. D. Balfour and Sons, of Newcastle, are the engineers for the undertaking.

Mr. F. L. Tulloch, representing the Local Government Board, has held an inquiry at Ombersley, concerning an application of the Droitwich Rural District Council for sanction to borrow £3,000 for sewerage works for the parish of Ombersley. The engineer is Mr. H. W. Taylor, C.E.

Mr. Hyman H. Collins, F.R.I.B.A., has been re-elected as an alderman for Paddington Borough Council, on which body he also serves as chairman of the public health committee.

A good business in London properties was carried out at the Tokenhouse Yard Mart last week, though limited to four days. One sale alone contributed £32,500 to the total, a freehold estate of 53 houses and shops, and one beerhouse situate in Copenhagen-street, and three contiguous roads, Barnsbury, N., the whole lot at ground-rents of £113 Gs. 8d., with reversions in six months to 2½ years to rack-rentals of about £1,500 per annum, being sold for £20,860. Another leasehold estate of 17 houses in Stoke Newington, with a rental value of £1,000 per annum, realised £8,650; and the Eldon House Building Estate of 3½ acres in Mitcham-road, Tooting Graveney, realised £5,000, equal to £1,500 per acre.

Trade News.

WAGES MOVEMENTS.

THE LABOUR MARKET IN OCTOBER.—The monthly memorandum prepared by the Labour Department of the Board of Trade is based on 3,673 returns—viz., 2,298 from employers or their associations, 1,302 from trade unions, and 73 from other sources. Apart from seasonal changes, employment on the whole is reported to have been much the same in October as in September. As compared with a year ago, employment generally is worse, and the percentage of unemployed members of trade unions continues to be higher than the mean percentage for the corresponding month in the past ten years. In the 226 trade unions, with an aggregate membership of 555,105, making returns, 32,358 (or 5·8 per cent.) were reported as unemployed at the end of October, as compared with the same percentage in September, and with 5·0 per cent. in 223 trade unions, with a membership of 518,412, from which returns were received for October, 1902. The mean percentage of unemployed returned at the end of October during the past decade was 4·4. Employment in the building trades is dull, and worse than a month and a year ago. The percentage of unemployed trade union members among carpenters and joiners was 5·6 at the end of October, compared with 4·0 at the end of September, and 4·0 a year ago. The percentage for plumbers was 6·6 at the end of October, compared with 6·4 at the end of September, and 5·8 a year ago. In the furnishing and woodworking trades employment has generally declined during the month, and is worse than a year ago. The percentage of unemployed trade union members at the end of October was 5·2, as compared with 4·7 in September, and 4·3 in October, 1902. The total number of workpeople involved in disputes which began or were in progress during October, 1903, was 10,747, compared with 11,577 in September, 1903, and 24,151 in October, 1902. Definite results were reported during the month in the case of 21 disputes, new and old, affecting 5,068 workpeople. Of these disputes, six, involving 2,936 persons, were decided in favour of the workpeople; 12, involving 1,908 persons, in favour of the employers; and three, involving 194, were compromised. The changes in rates of wages reported during October affected about 12,000 workpeople, of whom about 900 received advances and 11,100 sustained decreases. The net effect of all the changes was a decrease of about £200 per week.

DUNDEE.—The Dundee Advertiser calls attention to the unfortunate condition of the local building trade. It has been found, it states, that the number of unemployed workmen is much larger than has been known for many years. The operatives chiefly involved are masons, joiners, and labourers, but others, such as plasterers, plumbers, painters, glaziers, and heating engineers are also feeling the pinch. Within recent months hundreds of young workmen, unable to find scope for their energies at home, have sought the wider fields offered by the colonies. Indeed, the departure of the emigrant train on Friday evenings has come to be numbered among the events of the week. The cause of this extraordinary depression is difficult to ascertain, but tenement property has been over-built, and no structures of a public character are meantime in course of erection. Within recent years a feature of the trade has been the steady and increasing tendency of those occupying central flats to move towards the suburbs. Tenements have thus suffered depreciation in value. From the strictly industrial point of view, the movement has advantages, inasmuch as it will lend an impetus to the erection of self-contained dwellings. The result of this shifting has been a corresponding movement of weekly tenants into better-class properties. This, in turn, has involved the desertion of the older and less salubrious localities, in the heart of which hundreds of one-roomed houses are vacant.

The Carnegie free library at Grays was opened by the Countess of Warwick on Friday. It has cost £3,000.

At a meeting of the Governors of the Glasgow and West of Scotland Technical College on Monday, Mr. Copland, who presided, stated that the building fund of the college amounted to £183,414. Good progress was being made in the building, and the contractors were being paid at the rate of about £1,500 a week.

On All Saints' Day the outlying church of All Saints, Shorthampton, Oxfordshire, was reopened. The building was falling into decay, but has now been restored at the cost of Mr. Vernon J. Watney, of Cornbury Park. During the work of restoration several wall-paintings dating from the 13th, 14th, and 15th centuries have been uncovered, and a remarkable bagioscope reopened. The architect was Mr. John Belcher, A.R.A., and Mr. Philip M. Johnston unveiled the mural paintings.

LIST OF COMPETITIONS OPEN.

Sunderland—Additions to Town Hall	£100, £50, £25	John W. Moncur, A.M.I.C.E., Borough Engineer, Sunderland	Nov. 21
Bray—Pavilion and Winter Gardens	£30, £15, £10, and three of £5 5s	Frank Bethell, Hon. Sec., Town Hall, Bray	30
Wakefield—Reconstructing Cattle Market	50gs. (merged), 25gs.	R. Ernest Langborne, Solicitor, Wakefield	Dec. 1
Elgin—School (340 places) .....	.....	Hugh Stewart, Clerk, Elgin	7
Selly Oak—Public Baths (Assessor) .....	.....	A. W. Cross, A.M.I.C.E., 23, Valentine-road, King's Heath	7
Clare, Suffolk—Water Supply Scheme (population 1,582) .....	.....	J. Bigmore, Clerk, 24, Queen-street, Haverhill, Suffolk	10
Herne Hill, S.E.—Public Library .....	.....	H. J. Smith, Clerk, Lambeth Town Hall, Kennington Green, S.E.	16
Aylesford—Single-Span Stone Bridge over Medway (Assessor)	100gs.	The Town Clerk, Maidstone	Jan. 1
Windsor—Elevations for Police and Fire Brigade Stations	25gs.	E. A. Stickland, A.M.I.C.E., Borough Surveyor, Windsor	15
Erdington—Council House and Free Library (Wm Henman, F.R.I.B.A., Assessor)	£50, £30, £20	Herbert H. Humphries, Eng., Public Hall, Erdington, Birmingham	Feb. 1
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Co.-Gen., 22, Laurence-Pounteney-lane, E.C. Mar. 31	
Fraserburgh—Infectious Diseases Hospital and Public Library .....	.....	William Alexander, Burgh Surveyor, Fraserburgh	—
Rhyl—Pavilion (10,000 places) at National Eisteddfod .....	.....	H. A. Tilly and J. W. Jones, Gen. Secs., Town Hall, Rhyl	—

LIST OF TENDERS OPEN.

BUILDINGS.

Hindley—Disinfectant House	Urban District Council	A. Holden, A.M.I.C.E., Surveyor, Hindley, Lancs	Nov. 21
Manchester—Stables and Messroom	Corporation	The City Architect, Town Hall, Manchester	21
Wargrave—Cottage and Engine House	Wokingham R.D.C.	W. G. A. Hambling, Architect, Queen's-road, Reading	23
Keighley—Alterations at Eastwood Schools	School Board	Wilson Bailey, Architect, Tanfield Buildings, Market-st., Bradford	23
Swansea—Rebuilding Rum Puncheon Inn	Wm. Williams	Henry C. Portsmouth, Architect, 6, Fisher-street, Swansea	23
Elgin—Villa, Porteaith-avenue .....	.....	R. B. Pratt, Architect, Town and County Bank Buildings, Elgin	23
Sheffield—Saleshops and Artisans' Dwellings, Soig Hill	Surplus Lands Committee	Gibbs and Flockton, Architects, 15, St. James's-row, Sheffield	23
Perth—Extension of Intermediate School	Glamorgan County Council	T. Mansel Franklin, Clerk, Westgate-street, Cardiff	23
Rochester—Alterations to Centre Tower of Cathedral	Guardians	C. H. Fowler, F.S.A., Architect, The College, Durham	23
Droxford—Repairs to Master's Office at Workhouse	Education Committee	Francis Clark, Clerk, Bishop's Waltham, Hants	23
Tottenham, N.—Altering Lancasterian Schools, Church-road	Co-operative Society	G. E. T. Laurence, Architect, 22, Buckingham-street, Adelphi, W.C.	23
Penwithick—Sunday School .....	.....	William J. Jenkins, Architect, Bodmin	24
Consett—Eight Houses, Garden-street and Clarendon-street .....	.....	E. Huntley, Secretary, Newmarket-street, Consett	24
Aranmore—Coastguard Station .....	.....	The Office of Public Works, Dublin	24
Sunderland—Wheat Sheaf Tramway Offices	Borough Council	F. E. Coates, A.R.I.B.A., 41, Fawcett-street, Sunderland	24
Fulham, S.W.—Terracotta Bandstand in South Park	H.M. Commissioners of Works	F. Wood, A.M.I.C.E., Boro' Engineer, Town Hall, Fulham, S.W.	25
Bootle, Liverpool—Post Office .....	.....	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	25
Alnwick—House, Swansfield Park-road	Urban District Council	M. Temple Wilson, M.S.I., Architect, Alnwick	25
Finchley—Cottage, &c., Long-lane	Borough Council	The Engineer, Council Offices, Finchley, N.	25
Fulham, S.W.—Iron Bandstand in South Park	Merthyr Tydfil School Board	F. Wood, A.M.I.C.E., Boro' Engineer, Town Hall, Fulham, S.W.	25
Merthyr—School (250 infants) at Edwardsville .....	.....	J. Llewellyn Smith, Architect, Aberdare	26
Pengam—Two Business Premises	Corporation	J. Davies, Coal Hole Inn, Gellihaif, Maesycwmmwr	26
Eastbourne—Fire Station, Grove-road	Town Council	P. A. Robson, A.R.I.B.A., Palace Chambers, 9, Bridge-street, S.W.	26
Evesham—Sulphate Plant Building	Electric Committee	P. H. Fletcher, Engineer, Gasworks, Evesham	26
Merthyr—Rebuilding 59, High-street	Urban District Council	C. M. Davies, 112, High-street, Merthyr Tydfil	26
Kilmarnock—Generating Station	Sanitary Committee	Robert Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	27
Waltham Abbey—Public Buildings	Guardians	W. T. Streather, Surveyor, High Bridge-st., Waltham Abbey, Essex	27
Lichfield—Taking down Houses, Upper St. John's-street	Urban District Council	Emerson Brooke, City Surveyor, Stowe-street Depot, Lichfield	27
Nottingham—Plant House at Workhouse	Urban District Council	G. Muncester Howard, Clerk, Bagthorpe, Nottingham	27
Knarborough—Purifier House	Borough Council	J. E. Walker, Surveyor, Town Hall, Knarborough	28
Dodworth—Brick Culvert .....	.....	George Strutt, Surveyor, High-street, Dodworth	28
Greenwich—Mortuary	Local Governing Body	Alfred Roberts, M.S.A., 18, Nelson-street, Greenwich, S.E.	30
Ipswich—Outpatients' Dept., Ipswich & East Suffolk Hospital	Co-operative Society	John S. Corder, Architect, Wimbourne House, Ipswich	30
Carnarvon—Gymnasium at County School	Royal Insurance Co.	Rowland Lloyd Jones, County Architect, 14, Market-st., Carnarvon	30
Radcliffe—Butcher's Premises and Manager's House	Urban District Council	J. G. Crone, Architect, 26, Cloth-market, Newcastle-on-Tyne	30
Halifax—Alterations to Premises, Commercial-street	Town Council	Thos. Kershaw, A.R.I.B.A., Bank Chambers, Halifax	30
King's Norton—Waiting-Room, &c. ....	.....	A. W. Cross, Surveyor, 23, Valentine-road, King's Heath	30
Batley—Destructor Buildings .....	.....	The Borough Surveyor, Branch-road, Batley	30
Moville—Lodge	Great Western Railway Co.	R. H. Nolan and Co., Carlisle-road, Londonderry	Dec. 1
Plymouth—Warehouses on Trinity Pier, Gt. Western Docks	Ecclesall Bierlow Union Guardians	G. K. Mills, Secretary, Paddington Station, W.	1
Sheffield—Maternity Hospital at Workhouse	Royal National Lifeboat Institution	R. W. Wignall, Architect, 14, East-parade, Sheffield	1
Anstruther—Lifeboat House, &c.	Felling Education Committee	W. T. Douglas, Architect, 15, Victoria-street, S.W.	1
Heworth—Alterations to House	Great Western Railway Co.	H. Miller, Architect, Council Buildings, Felling, Durham	1
Ebbw Vale—Waiting Room at Victoria Station .....	.....	G. K. Mills, Secretary, Paddington Station, W.	1
Moville—Coachhouse and Stable	Borough Council	R. H. Nolan and Co., Carlisle-road, Londonderry	2
Hammermith, W.—Free Library, Brook Green-road	Bishop Auckland Indus. Co-op. Soc.	Henry T. Hare, F.R.I.B.A., 13, Hart-street, Bloomsbury, W.C.	2
Evenwood—Branch Store	Borough Council	F. H. Livesay, Architect, Bishop Auckland	2
Poplar, E.—Library Buildings at Cubitt Town	Urban District Council	C. H. Norton, Architect, 14, Bedford-row, W.C.	3
Cymmer—Librarian's House	Guardians	Wm. Thomas, Free Library, Cymmer, Perth	3
Birkdale—Hospital	Hartford & Ware Joint Hospital Bd.	J. F. Keeley, Clerk, Town Hall, Birkdale, Lancs	4
Haltwhistle—Boardroom	Admiralty	John M. Clark, F.S.I., Surveyor, Haltwhistle	9
Gallows Plain—Alterations, &c., at Isolation Hospital	Birmingham University	W. Leonard Grant, Architect, Sittingbourne	11
Littlehampton—Coastguard Station	Urban District Council	The Director of Works Dept., 21, Northumberland-avenue, W.C.	11
Bournemouth—Superstructure of University Buildings	Guardians	Aston Webb and Ingress Bell, Archts., 19, Queen Anne's Gate, S.W.	14
Strabane—Gasworks .....	.....	Charles Hunt, M.I.C.E., 15, Victoria-street, Westminster	15
Clutton, Bristol—Alterations to Workhouse .....	.....	W. F. Bird, Architect, Midsomer Norton	16
Adel, Leeds—Detached Cottages	Peter Blyth	George W. Atkinson, Architect, 1, Mark-lane, Leeds	—
Hooley Hall—Office and Stable	Methodist New Connexion	Burton and Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyoc.	—
Newport—Arcade Premises, High-street	J. Carter Jonas and Sons, Estate Agents, Cambridge	Habershon, Fawcner, & Co., Archts., 41, High-st., Newport, Mon.	—
Horden Colliery—House and Shop	T. J. Jackson	W. A. Noble, The Colliery, Castle Eden, R.S.O., Durham	—
Ebbw Vale—Rebuilding Shops and Premises	York City and County Banking Co.	B. J. Francis, Architect, Aberavenny	—
Cheadle Heath—Church	James Joicey and Co., Ltd.	J. Wills and Sons, Architects, Victoria Chambers, Derby	—
Hummerstone—Small Farmhouse on Carrington Estate	Edward Gabriel, Architect, 42, Old Broad-street, E.C.	J. Carter Jonas and Sons, Estate Agents, Cambridge	—
Stanley—Printing Works	Gaslight Co.	T. E. Crossling, Architect, Front-street, Stanley	—
Weston-super-Mare—Timber Pavilion on Grand Pier	Gibbs, Mew, and Co., Ltd.	Mayoh and Haley, 12, Norfolk-street, Strand, W.C.	—
Boston Spa—Banking Premises .....	.....	Danby and Simpson, Architects, 10, Park-row, Leeds	—
Stretford—Reforming Wesleyan Day School .....	.....	W. A. Rushworth, 1, 283, Chester-road, Stretford, Manchester	—
Tanfield Lea—Coke Ovens .....	.....	James Joicey and Co., Ltd., Newcastle-on-Tyne	—
Portsmouth—Nautical School .....	.....	John Harding and Son, Architects, Salisbury	—
Wrexham—Showroom, Salop-road .....	.....	Walter Webb, Architect, Bargates, Whitechurch	—
Morley—St. Francis's Church and School .....	.....	.....	—
Allington—Rebuilding Old Inn .....	.....	.....	—
Whitchurch, Shropshire—Alexandra Temperance Hotel .....	.....	.....	—

ELECTRICAL PLANT.

Edinburgh—Electric Light Installation at Police Station	Town Council	The Resident Electrical Engineer, Dewar-place, Edinburgh	Nov. 21
Glasgow—Electric Light Materials and Fittings	Caledonian Railway Co.	J. Lorimer, Stores Supt., Charles-street, St. Rollox, Glasgow	23
Swindon—Switchboard	Corporation	Lacey and Sillar, Engineers, 78, King-street, Manchester	23
Kirkcaldy—Steam-Engine and Dynamo	Caledonian Railway Co.	G. F. Francis, Burgh Electrical Engineer, Victoria-road, Kirkcaldy	23
Glasgow—Telegraph Apparatus, Telephones, &c.	United Tramways Co.	J. Lorimer, Stores Supt., Charles-street, St. Rollox, Glasgow	24
Dublin—Electrical Supplies	Urban District Council	R. S. Tresilian, Secretary, 9, Upper Sackville-street, Dublin	30
Hornsey—Meters, &c. ....	.....	Norman Staniland, Electricity Works, Tottenham-lane, Hornsey	30
Colombo, Ceylon—Electrical Energy	London County Council	The Office of the Colonial Secretary, Colombo	Dec. 1
London, S.W.—Wiring Sub-stations and Car-sheds	Gt. Western Railway Co.	The Electrical Engineer, 373, Camberwell New-road, S.E.	5
Park Royal, Acton—Plant	London County Council	Kennedy and Jenkin, 17, Victoria-street, Westminster, S.W.	7
Greenwich—Generators, &c. ....	.....	The Clerk, London County Council, Spring Gardens, S.W.	8
Sydney—Telegraph Materials	Chorlton-on-Medlock Guardians	The Deputy Postmaster-General, Sydney, New South Wales	30
Handforth, Manchester—Electric Motor .....	.....	G. R. Peers, A.M.I.E.E., 16, John Dalton-street, Manchester	—

ENGINEERING.

Hindley—Disinfectant	Urban District Council	T. Robey, Clerk, Council Offices, Hindley	Nov. 21
Rochford—Waterworks	Rural District Council	H. T. Sidwell, Engineer, Rochford, Essex	23
Egmont—Punching and Shearing Machine	Wallasey U.D.C.	H. W. Cook, Clerk Public Offices, Egmont	23
Manchester—Eight Storm-Water Sluices	Rivers Committee	The Secretary, Rivers Department, Town Hall, Manchester	25
Horwich—Reservoirs	Urban District Council	Peter Taberner, Clerk, Council Offices, Horwich	25
Toronto, Bishop Auckland—Heating Mission Church .....	.....	Hicks & Charlewood, Archts., 67, Westgate-rd., Newcastle-on-Tyne	25
Dodworth—Brick Culvert	Urban District Council	George Strutt, Surveyor, High-street, Dodworth	25

ENGINEERING—continued.

Brandon—Waterworks	Rural District Council	Herbert Walker and Son, Albion Chambers, King-st., Nottingham Nov. 30
Palencia, Spain—Waterworks	Metropolitan Asylums Board	The Directorate-General, Local Administration, Madrid
Tottenham, N.—Alteration to Hot-Water Apparatus, N.E. Hos.	Rural District Council	W. T. Hatch, A.M.I.C.E., Embankment, E.C. Dec. 1
Chelmsford—Pipelining at Ingatstone Waterworks	Committee	J. Dewhurst, A.M.I.C.E., Eog., Avenue Chambers, Chelmsford
Belfast—Heating Assembly Buildings	Town Council	Young and Mackenzie, Architects, Scottish Amicable Buildings, Belfast
Brighton—Plant at Southwick Power Station	Corporation	Francis J. Tillstone, Town Clerk, Town Hall, Brighton
Maidstone—Light Railways	Société des Chemins de Fer Vicinaux	Stephen Sellow, Engineer, 36, Victoria-street, Westminster
Asche to Alost, Brussels—Railway	Urban District Council	The Director General, 14, Rue de la Science, Brussels
Bishop's Stortford—Repairing Pumping Engines	P. N.Y., and L.I. Railroad Co.	R. S. Scott, A.M.I.C.E., Surveyor, Bishop's Stortford
New York, U.S.A.—Tunnels from Sixth Avenue to East River and Long Island City	Urban District Council	Jacobs and Barringer, 78, Gracechurch-street, E.C.
Strabane—Gasworks	P. N.Y., and L.I. Railroad Co.	Charles Hunt, M.I.C.E., 15, Victoria-street, Westminster, S.W.
New York, U.S.A.—Tunnels under Thirty-second-street, Manhattan, and North (Hudson) River	Town Council	Jacobs and Barringer, 78, Gracechurch-street, E.C.
Inverary—Pier Repairs	P. N.J., and N.Y. Railroad Co.	The Engineer's Department, County Hall, Spring Gardens, S.W.
New Jersey, U.S.A.—Tunnels under Bergen Hill and North (Hudson) River	London County Council	The Clerk of London County Council Spring Gardens, S.W.
London, S.E.—Tunnel Between Rotherhithe and Ratcliff	Ministry of Public Works	The Com. Intel. Branch, Board of Trade, 50, Parliament-street, S.W.
Greenwich, S.E.—Six Electrically Driven Boiler Feed-Pumps	Stow Union Guardians	John S. Corder, Architect, Tower-street, Ipswich
Cairo—Three Road Bridges over the Nile	James Joicey and Co., Ltd., Newcastle-on-Tyne	
Stowmarket—Heating Main Block of Workhouse by Steam		
Tanfield Lea—Colliery Railway Branches (1,600 yards)		

FENCING AND WALLS.

Hindley—Palisade Wall near Grammar School	Urban District Council	Alfred Holden, A.M.I.C.E., Surveyor, Council Offices, Hindley
Glyn-Neath—Repairing Churchyard Wall	Urban District Council	J. Stanley Thomas, Secretary, Stanley House, Glyn-Neath, Wales
Savile Town, Thornhill—Boundary Walls, Savile-road	Caledonian Railway Co.	S. W. Parker, Surveyor, Council Offices, Thornhill
Glasgow—Wire Fencing	Urban District Council	J. Lorimer, Stores Supt., Charles-street, St. Rollox, Glasgow
Newmachar—Enclosing Walls at Cemetery	Urban District Council	William Buxton, Architects, 81, Union-street, Aberdeen
Glyn-Neath—Rebuilding Wall in front of Bethel Chapel	Urban District Council	J. Stanley Thomas, Secretary, Stanley House, Glyn-Neath
Swadincote—Boundary Wall	Urban District Council	G. B. Smedley, Engineer, Gasworks, Swadincote
Abertillery—Retaining Walls at Park Hotel, Glandwr-road	Urban District Council	G. Kenshole, Architect, Station-road, Bargoed
Swanage—Retaining Wall, Shore-road	Urban District Council	Thomas Randall, Clerk, Town Hall, Swanage
Mobile—Wire Fencing	Urban District Council	R. H. Nolan and Co., Carlisle-road, Londonderry
Southend-on-Sea—Iron Fencing (900 yards) at Chalkwell Park	Corporation	E. E. Elford, M.I.M.E., Boro' Surveyor, Southend-on-Sea
Blackfriars, S.E.—River Wall, &c., at Power Station	H.M. Commissioners of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
Evenwood—Boundary Walls, &c., to New Cemetery	Burial Board	Pegg and Farrow, Architects, 7, Market-place, Barnard Castle

FURNITURE AND FITTINGS.

Glasgow—Office Furniture	Caledonian Railway Co.	J. Lorimer, Stores Supt., Charles-street, St. Rollox, Glasgow
Southampton—Desks for Corn Market	Corporation	J. A. Crowther, A.M.I.C.E., Borough Engineer, Southampton
Newport—Eighty Bedsteads, &c.	Guardians	The Union Offices, Queen's Hill, Newport, Mon.
Leyton, E.—Dual Desks (150) at Temporary School	Urban District Council	Wm. Jacques, A.R.I.B.A., 2, Fen-court, E.C.
Kendal—Refitting Shop, 6, Cheapside	C. Heap	John Stalker, M.S.A., Architect, Kendal

PAINTING.

Elgin—Villa, Forteach-avenue	Electric Committee	R. B. Pratt, Architect, Town and County Bank Buildings, Elgin
Kilmarnock—Generating Station	Bishop Auckland Indus. Co-op. Soc.	K. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock
Evenwood—Branch Store	Howley Hall Golf Club	F. H. Livesay, Architect, Bishop Auckland
Batley—Pavilion, &c.		W. Hanstock and Son, Branch-road, Batley

PLUMBING AND GLAZING.

Cardiff—Lead Service Work	Corporation	C. H. Priestley, M.I.C.E., Waterworks Eng., Town Hall, Cardiff
Kilmarnock—Generating Station	Electric Committee	K. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock

ROADS AND STREETS.

Cheriton, Kent—Roadmaking	Urban District Council	Arthur Atkinson, Clerk, Public Offices, Cheriton, Kent
Kinsale—Roads Maintenance	Rural District Council	John Murphy, Clerk, Council Office, Workhouse, Kinsale
Southend-on-Sea—Footway Paving	Essex County Council	Percy J. Sheldon, A.M.I.C.E., Chief Surveyor, Chelmsford
Plymouth—Making-up Streets and Lanes	Highway Committee	James Paton, Borough Engineer, Plymouth
Blackburn—Street Works	Urban District Council	William Stubbs, Borough Engineer, Municipal Offices, Blackburn
Ilford—Levelling, &c., The Pavement, Seven Kings	Urban District Council	H. Shaw, A.M.I.C.E., Surveyor, Town Hall, Ilford
Ashton-upon-Mersey—Making-up Private Streets	Urban District Council	F. Hutton, Surveyor, Public Hall, Ashton-upon-Mersey
West Ham—Making-up Streets	Town Council	J. G. Morley, Borough Engineer, Town Hall, West Ham
Keighley—Paving Damens-road	Corporation	W. H. Hopkinson, A.M.I.C.E., Borough Engineer, Keighley
Pontypool—Footway	Urban District Council	H. H. Haden, Clerk, Pontypool
West Hartlepool—Streets	Corporation	J. W. Brown, M.I.C.E., Borough Engineer, West Hartlepool
Erdington—Making-up Copley Hill	Urban District Council	Herbert H. Humphries, Surveyor, Public Hall, Erdington
Newport—Street Improvements	Corporation	R. H. Haynes, Borough Engineer, Town Hall, Newport
Gateshead—Paving Streets	Corporation	J. Bower, C.E., Borough Engineer, Town Hall, Gateshead
Wood Green, N.—Making-up Brampton Park-road	Urban District Council	C. J. Gungor, A.M.I.C.E., Surveyor, Town Hall, Wood Green
Ealing—Making-up Portion of Adelaide-road	Town Council	C. Jones, M.I.C.E., Boro' Engineer, Town Hall, Ealing, W.
Cardiff—Paving Works	Corporation	C. H. Priestley, M.I.C.E., Waterworks Eng., Town Hall, Cardiff
Ealing—Making-up Sydney-road	Town Council	C. Jones, M.I.C.E., Boro' Engineer, Town Hall, Ealing, W.
Ware—Making Good Vicarage-road	Urban District Council	J. Elliott Smiles, Surveyor, New-road
Ealing—Making-up Melbourne-avenue and Brisbane-road	Town Council	C. Jones, M.I.C.E., Boro' Engineer, Town Hall, Ealing, W.
Ealing—Making-up Oaklands-road and St. Kilda-road	Town Council	C. Jones, M.I.C.E., Boro' Engineer, Town Hall, Ealing, W.
Waltham Abbey—Channelling and Kerbing	Urban District Council	W. T. Streather, Highbridge-street, Waltham Abbey
St. Anne's-on-Sea—Street Works	Urban District Council	T. Bradley, Clerk, Council Offices, South-drive, St. Anne's-on-Sea
Leeds—Levelling, &c.	Rural District Council	E. J. Silcock, M.I.C.E., 10, Park-row, Leeds
Finisbury Circus, E.C.—Wood Paving	Streets Committee	The Corporation Engineer, Public Health Dept., Guildhall, E.C.
Southend-on-Sea—Macadam Roadway in Marine Parade	Corporation	E. J. Elford, M.I.M.E., Borough Surveyor, Southend-on-Sea
Wanstead—Artificial Stone Paving in High-street	Urban District Council	Charles H. Bressey, Surveyor, Council Offices, Wanstead
Hoddesdon—Kerbing	Hertfordshire County Council	Urban A. Smith, County Surveyor, Hatfield
Carshalton—Making-up Grosvenor-avenue	Urban District Council	W. W. Gale, A.M.I.C.E., Surveyor, High-street, Carshalton
Levenshulme—Private Street Works	Urban District Council	James Jepson, Surveyor, Guardian Chambers, Tiviot Dale, Stockport

SANITARY.

New Malden, N.—Sewers, &c.	Urban District Council	T. B. Simmonds, Eng., Council Offices, Cambridge-rd., New Malden Nov. 21
Levenshulme—Drain	Urban District Council	J. Jepson, Surveyor, Guardian Chambers, Tiviot Dale, Stockport
Bury St. Edmunds—Sewerage Works	Corporation	G. R. Strachan, M.I.C.E., 7, Victoria-street, Westminster, S.W.
Alnmouth—Raising Chambers	Rural District Council	H. W. Walton, Clerk, Alnwick
Dublin—Culvert	Great Northern (Ireland) Rly. Co.	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin
Bitterne—Cleansing Sewers (4 miles)	South Stoneham R.D.C.	E. T. Westlake, Clerk, 23, Portland-street, Southampton
Hastings—Sewers	Corporation	P. H. Palmer, M.I.C.E., Borough Engineer, Town Hall, Hastings
Belper—Sewerage Outfall Works	Urban District Council	C. J. Lomax, A.M.I.C.E., Alliance Bldgs., 37, Cross-st., Manchester
Pontypool—Public Urinal, Hanbury-road	Urban District Council	H. H. Haden, Clerk, Pontypool
Bettwy-Goed—Sewer, &c.	Urban District Council	R. R. Owen, Clerk, Union Offices, Llanrwst
Birmingham—Storm-Water Culverts	Public Works Committee	John Price, City Engineer, Council House, Birmingham
West Wylam—Sewerage Works	Hexham Rural District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on-Tyne
Lichfield—Sewerage Works	Corporation	Elliott and Brown, Engs., Burton Bldgs, Parliament-st., Nottingham
Dodworth—Brick Culvert	Urban District Council	George Strutt, Surveyor, High-street, Dodworth, Yorks
Thornton, near Poulton-de-Fylde—Sewerage Works	Joint Sewerage Committee	Arthur Hindle, A.M.I.C.E., 44, Abingdon-street, Blackpool
Hornsey, N.—Sewers, &c., Campsbourne Estate	Borough Council	E. J. Lovegrove, Boro' Eng., Municipal Offices, Highgate, N.
Brighton—Renewing Sanitary Appliances at Workhouse	Guardians	H. S. Reed, Parochial Offices, Prince's-street, Brighton
Trowbridge—Sewers	Urban District Council	H. G. Nicholson-Lailley, M.S.A., M.S.I., Town Hall, Trowbridge
Castletownbere—Sewerage Works	Rural District Council	Richard Evans, C.E., 53, South Mall, Cork
Southend-on-Sea—Sewers	Corporation	E. J. Elford, M.I.M.E., Borough Surveyor, Southend-on-Sea
Womersley—Sewers, &c.	Hambleton Rural District Council	Edward L. Lunn, Surveyor, 36, High-street, Guildford
Newton, Scotland—Sewers, &c.	Laarak District Committee	W. L. Douglass, C.E., District Engineer, District Offices, Hamilton

STEEL AND IRON.

Buxton—Cast-Iron Pipes (750 tons)	Urban District Council	G. H. Hill and Sons, Civil Engineers, 3, Victoria-st., Manchester
Newark—Cast-Iron Pipes (300 tons)	Corporation	H. Rofe and Son, 8, Victoria-street, Westminster
Fulham, S.W.—Iron Bandstand, South Park	Borough Council	Francis Wood, A.M.I.C.E., Town Hall, Fulham, S.W.
Cardiff—Cast-Iron Street Service Covers	Corporation	C. H. Priestley, M.I.C.E., Waterworks Eng., Town Hall, Cardiff
Birkenhead—Steel Girders (200 tons) for Bridges	Railway Joint Committee	The Joint Engineer, Woodside Station, Birkenhead
Dublin—Iron, Steel, Castings, &c.	United Tramways Co.	R. S. Tresilian, Secretary, 9, Upper Sackville-street, Dublin
Thornton—Cast-Iron Pipes (12in. and 6in.)	Joint Sewerage Committee	Arthur Hindle, A.M.I.C.E., 44, Abingdon-street, Blackpool
Brandon, Suffolk—Cast-Iron Water Mains	Rural District Council	Herbert Walker and Sons, C.E.'s, King-street, Nottingham
Edinburgh—Cast-Iron Pipes	Gas Commissioners	W. R. Herring, M.I.C.E., New-street Works, Edinburgh
Clacton-on-Sea—Steel Roof at Waterworks	Urban District Council	Sudney Francis, A.M.I.M.E., Town Hall, Clacton-on-Sea
Ingatstone—Cast-Iron Water Pipes	Chelmsford Rural District Council	J. Dewhurst, Engineer, A.M.I.M.E., Avenue Chambers, Chelmsford Dec. 3

STORES.

Banbury—Stoneware Pipes, Lime, and Cement (One Year)	Town Council	N. H. Dawson, C.E., Borough Surveyor, Town Hall, Banbury	Nov. 21
Crompton—Granite Setts	Urban District Council	F. F. Gartside, Clerk, Town Hall, Crompton	" 21
West Hartlepool—Kerbs, Flags, and Cement (One Year)	Corporation	The Borough Engineer, 78, Church-street, West Hartlepool	" 23
Glasgow—Various Stores (One Year)	Caledonian Railway Co.	J. Lorimer, Stores Superintendent, Charles-st., St. Rollox, Glasgow	" 23
West Hartlepool—Sewer Pipes, Cement, &c. (One Year)	Corporation	The Borough Engineer, 78, Church-street, West Hartlepool	" 23
London, E.C.—Phosphor Bronze, &c.	Southern Mahratta Ry. Co., Ltd.	The General Offices, 48, Queen Anne's Gate, Westminster, S.W.	" 24
Builton-on-Trent—Fireclay Goods (One Year)	Gas and Electric Light Committee ..	H. L. Ramsden, Engineer, Gasworks, Burton-on-Trent	" 24
Hartlepool—Goods and Materials (One Year)	Corporation	F. C. Crumack, A.M.I.C.E., Borough Engineer, Hartlepool	" 24
Wood Green, N.—Fire Hydrants and Surface Boxes	Urban District Council	C. J. Gunyon, A.M.I.C.E., Surveyor, Town Hall, Wood Green	" 25
Edlington—Stone (One Year)	Urban District Council	H. H. Humphreys, Surveyor, Public Hall, Edlington	" 25
Dublin—Various Stores (One Year)	Gt. Southern & Western (Ireland) Ry.	F. B. Ormsby, Secretary, Kingsbridge Terminus, Dublin	" 25
Exmouth—Stores (One Year)	Urban District Council	H. C. Adams, Clerk, Public Hall Chambers, Exmouth	" 25
Wood Green, N.—Portland Cement	Urban District Council	C. J. Gunyon, A.M.I.C.E., Surveyor, Town Hall, Wood Green	" 25
Rickmansworth—Granite (300 tons)	Urban District Council	The Surveyor, Town Hall, Rickmansworth	" 26
Cardiff—Stores (One Year)	Corporation	C. H. Priestley, M.I.C.E., Waterworks Eng., Town Hall, Cardiff	" 26
Greenock—Cement, Paints, and Timber (One Year)	Harbour Trustees	The Engineer's Office, Municipal Buildings, Greenock	" 26
Haworth—Setts (3,000 yards of Sin.)	Urban District Council	W. Robertshaw, Clerk, Burlington Chambers, North-st., Keighley	" 26
Birmingham—Road Material (One Year)	Warwickshire County Council	John Wilnot, County Surveyor, Birmingham	" 26
Dublin—Mineral Oil (30,000 gallons)	Irish Lights Commissioners	Owen Armstrong, Sec., Irish Lights Office, Dublin	" 26
Warrington—Stores, &c. (One Year)	Cheshire Lines Committee	S. Saxton Barton, Stores Supt., Cheshire Lines, Warrington	" 27
Elgin—Road Metal (One Year)	Harbour Trustees	Alexander Hogg, County Road Surveyor, 24, Academy-st., Elgin	" 27
Swansea—General Stores (One Year)	Urban District Council	The Engineer, Harbour Office, Swansea	" 28
Felling—Stores (One Year)	Urban District Council	George Bolam, Clerk, Felling, R.S.O., Co. Durham	" 28
Swansea—Iron Castings, Timber, Oils, &c. (One Year)	Harbour Trustees	The Engineer, Harbour Office, Swansea	" 28
Dublin—Stores (One Year)	United Tramways Co.	The Secretary's Office, 9, Upper Sackville-street, Dublin	" 30
Dublin—Stores (One Year)	Midland Gt. Western (Ireland) R. Co.	The General Stores Department, Broadstone Station, Dublin	" 30
Natal—Sleepers (218,000)	Natal Government	The Agent-Gen. for Natal, 26, Victoria-street, Westminster, S.W.	Dec. 1
Dublin—Various Stores (One Year)	City of Dublin Steam Packet Co.	The Secretary, 15, Eden-quay, Dublin	" 2
Chatham—Stores (One Year)	Corporation	Charles Day, Borough Surveyor, Town Hall, Chatham	" 3
Aldershot—Tubes and Fittings (One Year)	Gas and Water Co.	R. W. Edwards, Secretary, Aldershot	" 4

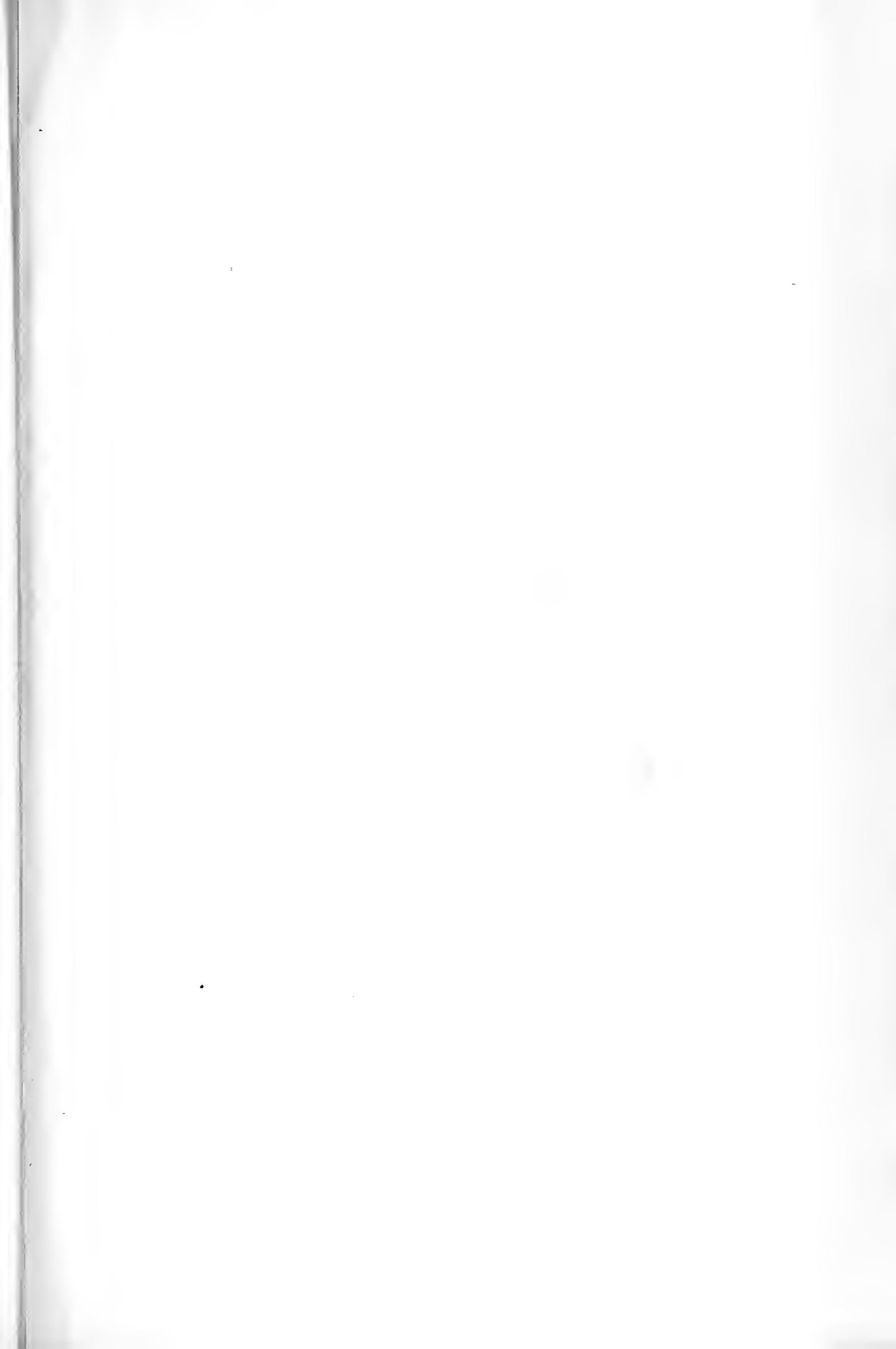
LATEST PRICES.

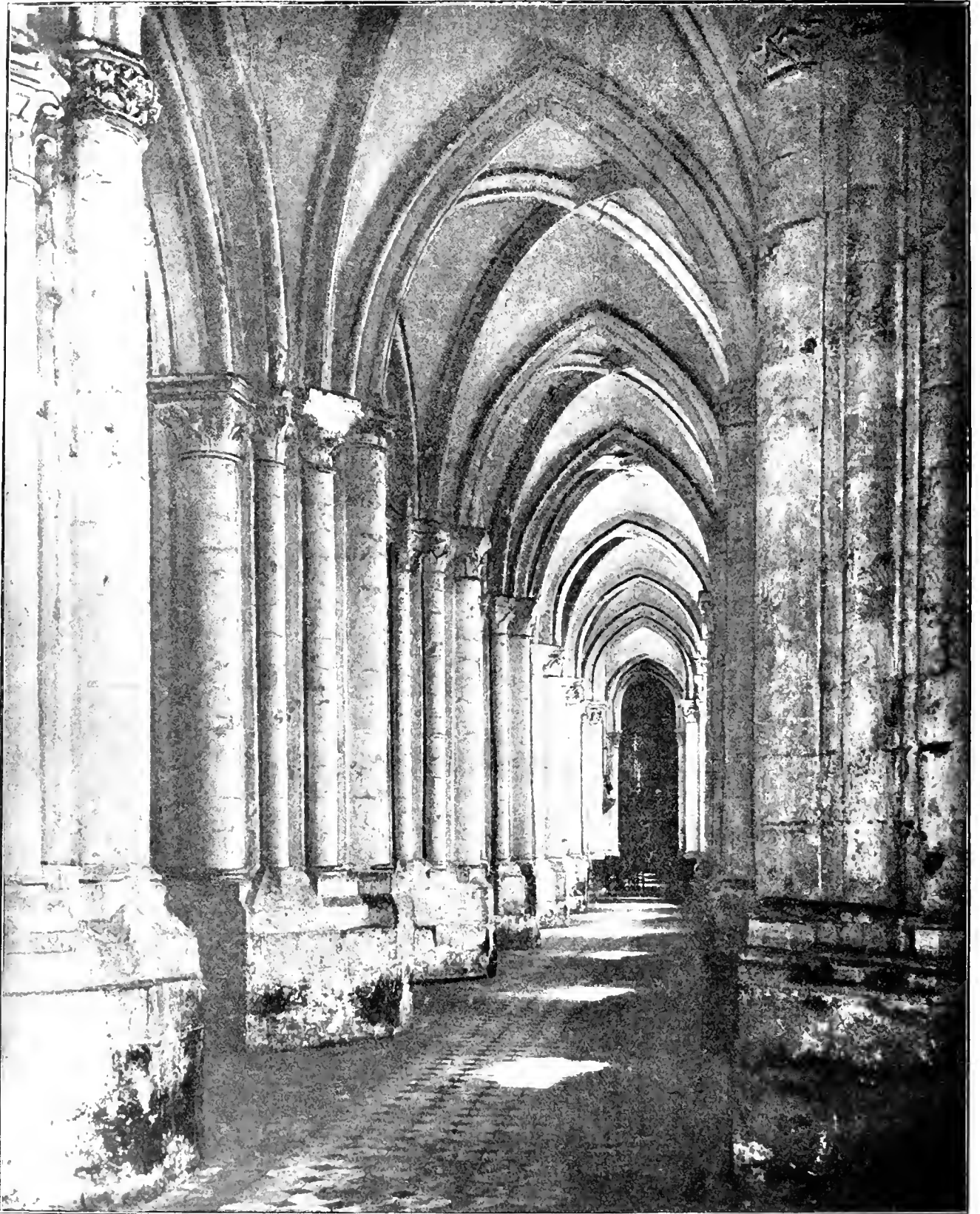
IRON, &c.

	Per ton.	Per ton.
Roller-Iron Joists, Belgian	£5 10 0 to £5 15 0	
Roller-Iron Joists, English	8 10 0 " 8 12 6	
Wrought-Iron Girder Plates	7 0 0 " 7 5 0	
Bar Iron, good Staffs	8 5 0 " 8 10 0	
Do., Lowmoor, Flat, Round, or Square	20 0 0 " 20 0 0	
Do., Welsh	5 15 0 " 5 17 8	
Boiler Plates, Iron—		
South Staffs	8 15 0 " 8 15 0	
Best Smedshill	9 10 0 " 9 10 0	
Angles 10s., Tees 20s. per ton extra.		

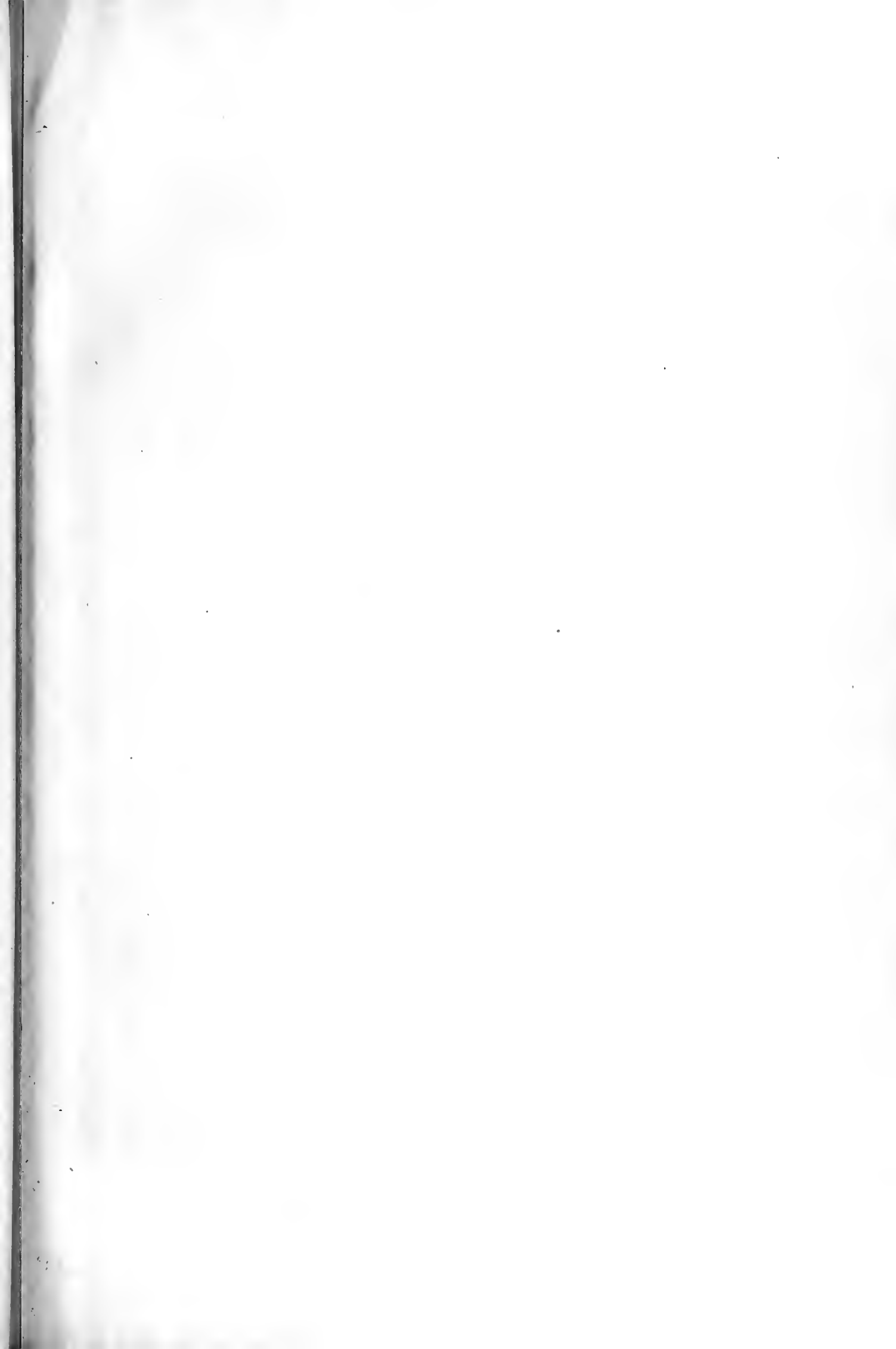
Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.
Builders' Hoop Iron, galvanised, £12 to £13 per ton.
Galvanised Corrugated Sheet Iron—

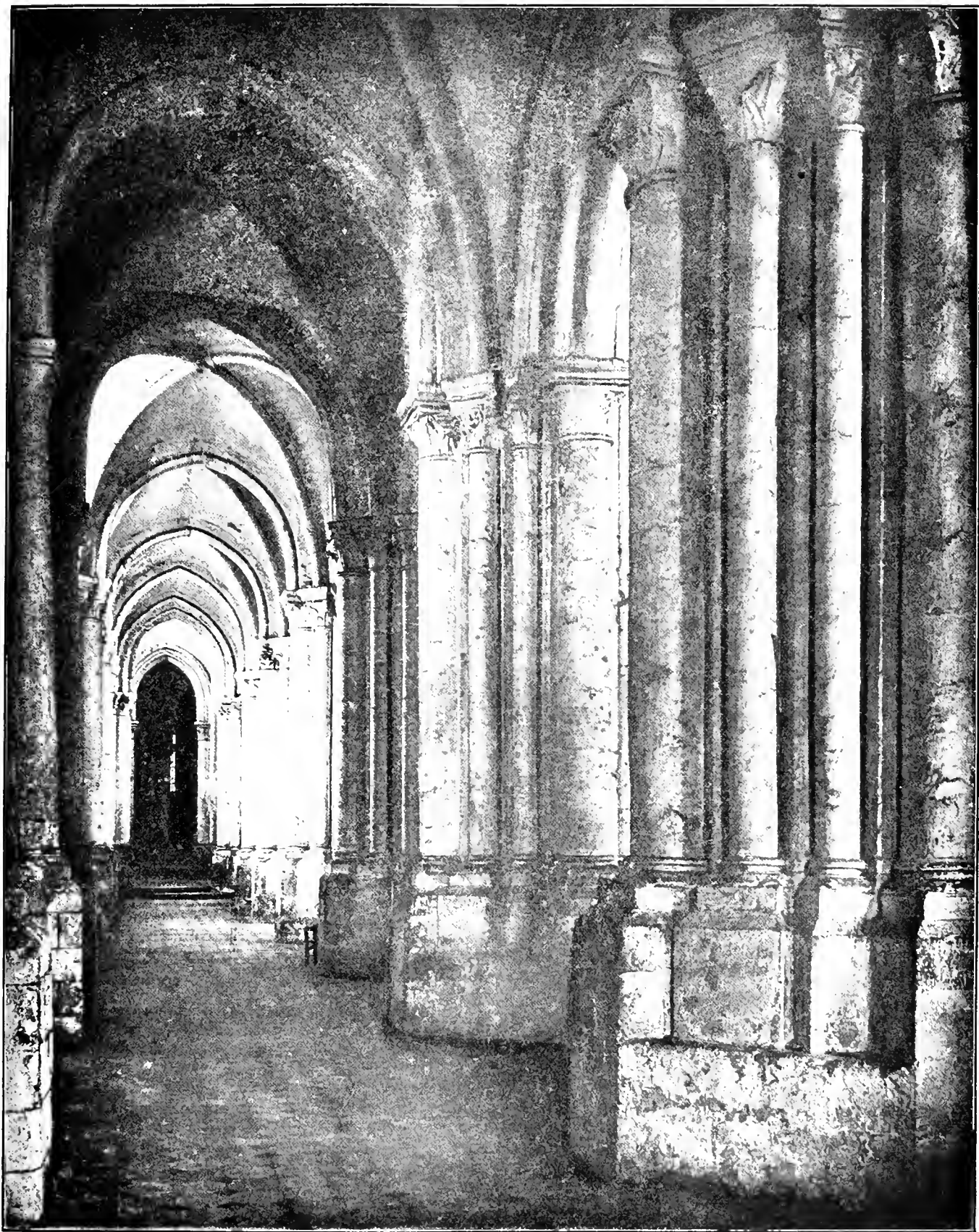
No. 18 to 20.		No. 22 to 24.	
8ft. to 8ft. long, inclusive	Per ton.	Per ton.	Per ton.
gauge	£11 15 0	£12 0 0	£12 0 0
Best ditto	12 5 0	12 10 0	12 10 0
	Per ton.	Per ton.	Per ton.
Cast-Iron Columns.....	£6 10 0 to	£8 10 0 to	£8 10 0 to
Cast-Iron Stanchions.....	6 10 0	" 8 10 0	" 8 10 0
Roller-Iron Fencing Wire	8 0 0	" 8 5 0	" 8 5 0
Roller-Steel Fencing Wire.....	6 5 0	" 6 10 0	" 6 10 0
Galvanised.....	7 15 0	" 8 0 0	" 8 0 0
Cast-Iron Sash Weights	4 12 6	" 4 12 6	" 4 12 6
Cut Clap Nails, 3in. to 6in.	9 5 0	" 9 5 0	" 9 5 0
Cut Floor Brads	9 0 0	" 9 0 0	" 9 0 0





SOUTH AISLE, ST. GERMER (OISE).
LOOK S. PHOTOGRAPH BY MR. H. HALLIDAY SPARLING





NORTH AISLE, ST. GERMER (OISE).
FROM A PHOTOGRAPH BY MR. H. HALLIDAY SPARKING.

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ARCHITECTURAL PRACTICE.

THERE is a prevailing idea that the architect's work is practically done when the contract drawings are finished, that after that period he can retire and watch his design being carried out. The period of architectural conception and incubation is no doubt the most important and vital—all the possibilities of the scheme are foreshadowed; but it is all anticipatory: the realisation may prove far from equal to it; indeed, it may be even a failure. The rough sketch of the painter on canvas is not the picture itself, though it may fairly be taken to be some guarantee of the real performance, for the same hands will carry out the composition, and the same scheme of colour can be followed. And the same with the sculptor's model; it is the work of the artist himself, who wishes to express in clay the lineaments and to suggest the form his finished work in marble is to take. In both these instances the design and execution are the work of one person. It was always so in the art of the past. In stone and wood carving this fundamental condition helped to produce the unity and vigour of the real work we are so fond of reproducing. The two functions are now quite separated; the architect or designer has his own office, or studio it may be, miles away from the actual building that is being carried out. He conceives an able design, full of invention and individual power; but so long as it remains on paper there is no reality about it; the drawings, in fact, may be and generally are made by an artistic draughtsman who knows very little about the materials and workmanship necessary to carry it into execution; the architect sends it out as his own. The transaction is a business one complete in itself; but it stops short of the real thing. It is made a matter of payment at so much on the estimated cost, or the designs are prepared for a premium, as in competition. The client bargains with the architect to prepare a design to include everything for so much—this is one transaction; and the latter enters into another bargain with the builder to carry it out at often the lowest rate—this is another and different transaction. There is no connection between the architect and builder, who may be as far as opposite Poles out of sympathy with each other. For, as one writer who speaks of the false position of both parties observes in regard to carving: "When one makes a 'design,' and another carries it out, the 'designer' sets his head to work (we must not count his hands, as they only note down results in a kind of writing), a design is produced, and handed over to the carver to execute. He, the carver, sets his hands and eyes to work to carry out the other man's idea, or, at least, interpret his notes for the same, his head, meanwhile, having very little to do further than transfer the said notes to his hands. For very good reasons, such an arrangement as this is bound to come to grief. One is that no piece of carving can properly be said to be 'designed' until it is finished to the last stroke. A drawing is only a map of its general outline, with, perhaps, contours approximately indicated by shading." The observation is equally true with regard to the relation between the designer of a building and the contractor. Even if the architect furnished a full-size model to the builder, he ought to be able to modify his design at every step of the progress of the actual building, to alter

his intention as the work develops under his hand. But in the modern sense of these vocations each is regarded as finished or complete in itself. So it is the architect's work at the present day is that of making "designs" for buildings. Whether these are really carried out in the true and honest meaning is not essential, as it ought to be.

To try and find means of bringing the two parts of the one art together again, to unify the efforts of designer and builder or craftsman, that they may again co-operate, is the chief object we ought to have in view. So long as the architectural profession are content to remain as they are, so-called designers of buildings, their work amounting only to architectural draughtsmanship and routine, they are perfectly independent of the actual result, and have not realised the full meaning of their art. In the practice of modern architecture it is obvious to all that the two branches of the profession to which we have referred are not actuated by a single aim. The two parts are not identical. Designs are made for buildings to satisfy a client or a committee, quite apart from any consideration of fitness or artistic merit. A client wants to build a villa that will be up to date and moderate, or a committee to select a design for a building that will be attractive, or that will enable them to obtain funds. Consideration of adaptability or cost scarcely enters into their minds, and the architect prepares a design without reference to the actual conditions. He makes it as a speculation as attractive as he can, as a finished set of drawings that can be treated or used as a design for a building, whether built or not. Its one aim is to be a representation, a kind of showcard. While the designer's aim is to make it attractive, the builder's aim is to build it at the least cost. The two ideals are not the same; one appeals to the senses as reached through the eye, by lines and perspectives and shading, the other to the practical requirements of the occupants, to the real sensible qualities of building materials, to the sense of convenience and comfort. In the plan, it is true, the architect touches more directly the real design of the building, as plan appeals most to the actual wants of those who use the building. A good plan, accompanied by an outline elevation or two defining the proportions and main features intended, may actually convey the architect's meaning more truly than an elaborately tinted and shaded elevation, which cannot be executed to produce the same effect. Those who have the largest experience in building will agree that a set of highly-finished drawings are very delusive, as they do not actually represent facts, materials, and real details. These generally evolve themselves during the execution of the work; the original intention is modified, and the details are changed and developed under this architect's hand as the work proceeds. Finished draughtsmanship may be excellent in conveying the appearance and details of old buildings to the eye—in this case it is representative of work actually executed—but to indicate the intention of a designer of a new building by a finished drawing is to forestall the real design. It either exceeds the realisation, or does not do justice to it, the exceedingly fidgety and dotty drawing exaggerates immensely the effect of the design; thus the "liney" drawings we often see make a comparative quiet and simple design look fussy, and seldom represent the real details, as they abound in unnecessary lines. When we speak of the architect's design for a building, we mean the actual work. This is the only true sense in which it can be intended; but nowadays his "design" means the conception on paper of a drawing. In this sense draughtsmanship has grown to be an art of itself, and the more finished the

drawing the more the public appreciate the work. The more elaborate and costly it the better. But when we come to consider architectural practice from the point of view of the builder, all is changed; the detail and ornament must be cut down, the amount of tender must not exceed a certain cost, the arrangement must be equal to the demand made, the sanitary construction must be perfect, the heating and ventilation adequate, the rooms planned with particular reference to all those who occupy the building, the materials and construction above reproach; matters which very considerably modify the design as represented by the draughtsman. And it is this practical side of the picture which has so little to captivate the designer and the client; it is the translation of design into matter-of-fact business. Those who make a good business as architects prefer the former side of the work; there is no trouble in negotiation, the labour in preparing sets of plans and elevations after the design has been agreed to is light compared with the responsibilities of carrying out the design, the periodical supervision of the building, and the trouble inseparable from having to do with an evasive and litigious contractor who is constantly on the alert in taking advantage of details of construction, in evading specification provisions, and in putting inferior material and workmanship into the building. When the profession begin to realise the twofold character of their calling, that the design of buildings is not completed when the contract drawings are finished, that they are only instruments in the architect's hands to effectually carry out his intentions, they will have a more satisfactory view of their art, and their work will be more thorough and honest. For the purpose of enforcing their remuneration and their claim to their drawings, architects avail themselves of this argument: that drawings are their tools, and have no other value; yet it is strange that if this is so, so much value should be attached to the design apart from the supervision of their work. Architecture will be more honest when the profession return, so far as they can, to the ancient idea that design and craftsmanship are one, and must go hand-in-hand, that they were never separated as they are now. To try and unite the two branches is the one way, and this must be attained by reconciling the designing with the supervision of buildings. The architect can at least endeavour to make his drawings more practical, even if by so doing he sacrifices something of draughtsmanship and finish; he must bring them into line with actual facts, not put more lines in his elevation than is really necessary to indicate detail. He must look at the execution of his design as its natural complement. They should be treated as one. When drawings are made to explain a design, to suggest a method of construction, they are valuable aids; but very often they are puzzling and enigmatical to the workman: they show eccentric and wasteful modes of work, they are arbitrary instead of being explanatory. The consequence is the builder rebels, or does the work in another or less troublesome way. Supervision of buildings is distinctly a part of the work of the architect, though it is generally regarded as a subordinate duty which can be intrusted to anyone who is practical. In the designing or office part of the architect's duty, every effort is made to attract the client, and to show a building that would, if properly executed, cost much more than is intended to be spent; but when we come to the executive function we find other counsels prevail. The system of selecting the lowest tender is a strong temptation to the builder to resort to cutting prices, which means, of course, a lowering of the standard specified. Advantage will be taken by the contractor of a certain class to secure "extras" or to evade the clear provisions of the specification. The hard bargaining, cutting and contriving, and

giving and taking very seriously contradict the architect's former work; the design is whittled down in substance, details are simplified, ornament omitted, often with advantage, but the building suffers in the long run. It is certainly the architect's duty to prevent these opposite influences as far as he can. Of course, the primary step is to study economy and simplicity in design so as to avoid the necessity of low tendering. But he can also do a good deal in the progress of the work in co-operating with the builder and the workmen, in agreeing upon methods of workmanship and material, in visiting the workshops, and in the selection of goods from different tradesmen. The various ways by which the architect and builder may co-operate in the design are rather obscured by the present system of contracting, which fixes upon certain quantities. Under the old plan, when the builder was employed to carry out the design upon the measure and value system, it was possible to make improvements and modifications during the progress of the work. The architect could, if he saw an improvement, alter his plan or his detail without inconvenience to the builder. But modern conditions, tendering, contracting, and machine labour, have all combined to make the architect's connection with the building operations less close. And for these reasons it is important to consider how far the constructive part of the profession can be brought into closer relationship with the design. A more thorough knowledge of construction and the processes of building is of course essential. We are beginning to realise the value of technological training; but at present such instruction is confined to students engaged in the practical work of building, to craftsmen especially. This no doubt is a great gain, the trades connected with building are often incapable of grasping the principles of design, they are often deficient, as the examiners of the Board of Education have said, in elementary knowledge of physical science and drawing, and of expressing their ideas with precision. When they have mastered these elements, we may look forward to a more intelligent appreciation of the architectural reasons of design than they now possess, and they will be able to approach nearer to the standard required by the profession. But this training is perhaps beginning at the wrong end. We want levelling-up on both sides. The architectural student is at present very much in the hands of those in our schools who are attempting to impart practical knowledge by precept and example, without reaching down far enough to the technical methods of the workman. The class and office instruction have been mainly confined to drawing and historical details of building; and between the architect and the workman there is still a gulf to be bridged. We cannot lose sight of the indifference of the younger professional man to the methods of work of the building trades. He places a scheme or design in their hands, which to them appears arbitrary, and he expects it to be carried out. Therefore we think a more thorough educational system ought to begin at both ends. The architect and designer must be able to show those who carry out his designs that he understands their materials, difficulties, and limitations; that his ideas are reasonable and practicable, and upon these conditions he is more likely to influence them.

MUNICIPAL HOUSING SCHEMES.

WHEREVER we go in London we observe how rapid has been the progress in new building schemes and the housing of the working classes. Demolition of a large area is quickly followed by the erection of large and often palatial-looking blocks of dwellings in process of construction, or completed and occupied. The borough councils have

lost no time in setting this problem before them and in carrying out the provisions of Part II. of the Housing of the Working Classes Act, 1890. This Act, as our readers know, empowers local authorities to prepare and execute schemes for the improvement of areas too small to be of general importance to the county and in conjunction with the London County Council or otherwise. This part of the Act deals with all dwelling-houses unfit for human habitation, or obstructive buildings, and for converting an insanitary area too small to be dealt with under Part I., so that the enactment has a wide application in London and other populous towns. Large insanitary areas only are dealt with under Part I., or those which the medical officer thinks are of importance to the County of London as a whole. Early in the present month the Borough Council of Bermondsey laid the foundation-stone of four blocks of model dwellings which will house nearly a thousand persons, and this scheme may be taken as an example of many others that have been carried out during the last few years. From the site of the Bermondsey dwellings unhealthy slums have been removed which housed not more than half the number of tenants. This is a good example of municipal enterprise which deserves to be followed.

Referring to the work of Mr. C. J. Stewart on "The Housing Question in London," the scheme is known as the "Fulford-street and Braddon-street Rotherhithe Improvement Scheme, 1897." The area is about two acres in extent, and consisted of properties inclosed by Rotherhithe-street, Seven Step-alley, Paradise-street, and houses in Love-lane and Iron-yard, and included 100 houses, composed mainly of houses backing on narrow courts and alleys, and in a very defective condition. The scheme originally provided for the erection of dwellings for 550 persons in lieu of the 736 persons displaced, and for the widening of the main streets. The area is rectangular in shape. In 1898 the vestry submitted plans for the dwellings to be erected on the cleared site, showing accommodation for 890 persons in 110 tenements of three rooms, 30 tenements of two rooms, and 55 single-room tenements. The estimated net cost of clearance was £29,120, the London County Council contributing half that sum. We may here briefly describe the design. The Bermondsey Borough Council advertised for competitive designs; and Messrs. Brocklesby, Marchmont, and East, were placed first by Mr. John Slater, vice-president of the R.I.B.A. We understand the four blocks will be all completed in March of 1905. Two blocks are parallel, and separated by a 40ft. yard between them in the rear, and this yard will be paved, and inclosed from the end streets by iron railings and gates. The second couple of blocks will face each other, separated by an area of 52ft. wide to be laid out as a garden, with paved paths, kept away from the ground-floor of each block. It will be reserved for the private use of the tenants of the four blocks of dwellings. In the design of these buildings, the architects have adopted the balcony system instead of the internal staircase, which has been so generally used in the London dwellings. The internal staircase has its drawbacks; it forms an undesirable rendezvous for tenants and children, a dark and draughty means of access, and encroaches upon the squareness of the plan. The balcony system is less costly, and gives more convenient access to the tenements; it allows better planning and grouping of the w.c.'s and sculleries, and insures ventilation. The buildings as planned give 25 one-room tenements, 165 two-room, and 45 three-room tenements. The dimensions are stated as follows:—Minimum width of living-rooms, 10ft. 6in., giving an area of 144super.ft. in the clear. Each bedroom has an area of 96ft. super. net, with a minimum width of

7ft. 6in. Some of the bedrooms will be entered direct from the lobby—a very desirable point. Solid and durable materials are to be used, and fire-resisting construction is provided. Externally the fronts will be faced with yellow stocks, with red brick dressings, and glazed bricks will be used in the staircases and balconies. The work is being done by direct labour, Messrs. Walter Lawrance and Son, Waltham Cross, being the contractors, and Mr. F. S. Smith, the clerk of works. From the elevations the design has something in common with other recent municipal buildings we have seen, being plainly treated with slight projections gabled, with a curb roof, and with dormer windows in the roof; the angle quoins will be of red brick, and the basement story of a darker material than the upper stories, there being four stories under the eaves and one story in the roof. The broken gables and curb roof of tile with the plain chimney stacks which rise above the roof impart a little variety to the block. The windows are quite plain, with square sash-frames and flat segmental arches, and the plainness of the brick style and fenestration and high roof give a substantial 18th-century character to the design.

The lately-built blocks of dwellings on the Millbank Estate is another instance of housing of a modern type. The blocks of substantial red brick with their tiled curb roofs and dormers and gabled ends, resemble in their main characteristics the Bermondsey scheme. In the Millbank Estate the blocks have been arranged on the area in quite a symmetrical form. It has two advanced plots of trapezoidal shape towards Dundonald-street, separated by a narrow garden plot in the centre about 300ft. in frontage towards that street. Beyond the garden behind, two plots of similar shape divided by a road in centre which forms the axis, are covered with blocks known as the "Turner" and "Ruskin" buildings, and still further back from Embankment is Erasmus-street, parallel with Dundonald-street, and having in its centre another block with advancing wings known as the "Hogarth" buildings, surrounded by land of the School Board. These are also flanked by other detached blocks named the "Gainsborough" and "Reynolds" buildings. These blocks have now been all completed and occupied, we believe. They have, as shown, been named after British artists, and, we believe, have been designed chiefly by the architects of the Council. They vary in plan and accommodation. "Hogarth" buildings were the first to be built, and provided rooms for 306 persons. They were completed in 1899. They contain 54 tenements, of which one is of five rooms, 10 of four rooms, 22 of three rooms, and 21 of two rooms. Twenty-four tenements are self-contained, except that the private w.c. of each is detached. The rents range from 7s. to 13s. per week, according to size of tenement. The Leighton and Millais buildings accommodate 240 persons in 50 tenements, of which 30 contain three rooms, and 20 two rooms; two of the tenements in each block are self-contained, and 15 of the same class have the private closets detached. These buildings have an obtuse-angle frontage; a large polygonal projection occupies the angle, and contains on each floor a living room and bedroom, and at the back the triangular-shaped corner is taken up by the staircase. The corner has on each side a small scullery and bedroom or living room in front, in addition to those in the polygonal corner, making two-roomed tenements.

Liverpool, among other large towns, has expended large sums in dwellings of an improved character. The largest scheme yet attempted by the corporation has just been commenced to supplant 511 insanitary houses in the neighbourhood of Hornby-street in that city. The new buildings will accommo-

date, it is stated, 2,446 persons at a cost of £150,000. The site was purchased by the corporation under the Act of 1890, as an "unhealthy area." In addition, several insanitary houses are to be removed. The whole accommodated 2,431 persons, which, according to the Act, had to be provided for. The design comprises 23 blocks or 445 dwellings. These are arranged as follows: 48 four-roomed dwellings, 270 three-roomed dwellings, 90 two-roomed dwellings, and 36 one-roomed dwellings, seven shops, and recreation ground. The dwellings are to be set back from the present line of street, making a width in front of 70ft. Each dwelling has its own separate sanitary provision. The blocks are of three stories. The living-room has a superficial area of 150ft., the principal bedroom 125 super. feet, and second bedroom 100ft., and the third bedroom 80 to 90 superficial feet. The average height of rooms is 9ft. Local grey bricks and red brick dressings have been used; the entrances are of buff terracotta. The staircases are lined with glazed roofs, the floors are constructed of small iron joists with coke-breeze concrete, on which the boards are nailed. The roofs are of slate. The ashes are discharged into bins by means of shoots at the back. The contractors for the first portion of these buildings are Messrs. Joshua Henshaw and Sons, and the amount of contract is £23,382. It is stated that 71 per cent. of the tenants displaced have availed themselves of the accommodation provided in the immediate neighbourhood. When the new dwellings on the demolished area are completed another portion will be cleared, and the dispossessed tenants will occupy the new houses; in this manner the scheme is proposed to be carried out in three portions. The one-room tenements are to be let at 2s. per week, the two-room tenements at 3s., the three-room at 4s., and the four-room tenements at 5s. The scheme will return 3 per cent. net at the above rates. Next in point of size to this scheme is the Victoria-square dwellings, which were built for a different class of tenants, and comprise 270 dwellings with 13 shops. These are a few instances of the schemes set on foot by large municipalities. Others may be mentioned, as those erected in Manchester, Birmingham, Glasgow, and other large centres of industry. They are indications of what may be done under the Housing of the Working Classes Act, 1890, and by means of instalments, or the gradual clearance of unhealthy areas and houses on a small scale, and the rebuilding of dwellings of an associated or self-contained class. In these recent developments of the housing problem, it will be seen the aim has been to provide tenements for each of several classes of tenants, instead of for one class. The two-roomed and three-roomed tenements are those most in demand in our great town centres, though the single-room tenement must not be forgotten, and a small percentage of shops and a recreation-ground appear also to be of value in any large scheme of rehousing.

THE ARCHITECTURAL ASSOCIATION.

THE fourth meeting for the present session of the Architectural Association was held on Friday evening at 9, Conduit-street, W., Mr. R. S. Balfour, Vice-President, in the chair. The following new members were elected:—Messrs. H. S. Stowell, J. A. Wilson, F. S. Chesterton, C. N. Lucass, G. Hubbard, R. H. Browne, Lucio Velasco, H. de A. Brown-Morrison, F. A. Col-lard, S. Murray, S. L. Stearne, and Sir G. Rayner. The chairman mentioned that at the meeting of the Discussion Section to be held on Wednesday, Dec. 2, a paper on "Theatres" would be read by Mr. H. T. B. Spencer. He also announced the following additional donations to the New Premises Fund:—Mr. H. Saxon Snell, £52 10s.; Mr. Edwin C. Pinks, £15 15s.; Mr. A. O. Col-lard, £12 12s.; Mr. W. D. Caroe (second donation), £10 10s.; the Proprietors of the *Builder*, £10 10s.; Mr. W. Talbot Brown, £5 5s.; Mr.

R. H. Butterworth, £5 5s.; Messrs. Lander, Bedells, and Crompton, £5 5s.; Mr. C. E. Varn-dell, £5 5s.; Mr. W. C. Waymouth, £5 5s.; Mr. Edmund Woodthorpe, £5 5s.; Mr. G. Cor-deroy, £5; Mr. A. H. Kersey, £3 3s.; Mr. J. E. Capell, £2 2s.; Mr. W. Dewes, £2 2s.; Mr. R. A. V. Harrison, £2 2s.; Mr. W. Stewart (second donation), £2 2s.; Mr. Arthur Stratton, £2 2s.; Mr. H. Topley, £2 2s.; Mr. F. A. Coles, £1 1s.; Mr. L. G. Detmar, £1 1s.; Mr. A. W. Field, £1 1s.; Mr. A. J. Hopkins, £1 1s.; Mr. Ernest Newton, £1 1s.; Mr. T. M. Smith, £1 1s.; Mr. C. F. A. Voysey, £1 1s.; Mr. R. H. Dods, 10s. 6d.; Mr. D. B. Hart, 10s. 6d.; Mr. L. Morgan, 10s. 6d.; and Mr. T. Campbell Pope, 10s. 6d. The chairman added that 162 members had generously doubled the ordinary subscription for the year, in accordance with the suggestion thrown out by the committee, the donations thus accruing amounting to £116.

FARM BUILDINGS.

A paper on this subject, illustrated by plans and sections, was read by Mr. H. M. CAUTLEY. The lecturer explained that he should speak wholly from within his practical experience, gathered on farms and amongst farmers in the Eastern Counties, and should restrict himself to the description of that type of buildings and fittings in which the truest economies were effected, and thus made most suitable to meet the requirements of those to whom farming was a real business. As to the site and position of the buildings, the first essential, he continued, is a good water-supply for both house and yards. This necessity was provided for by our ancestors by grouping all the buildings about some good pond, and though no doubt picturesque, in these days of windmill power and hydraulic rams, some further reasons must be adduced for planning the buildings about visible water. The next most important point is to get the building quite close to some hard metalled road maintained at the public expense. A farmer's private roads in and about his holding are a perennial source of expense to him. As to the position of the buildings on the holding, in an arable one they should be as near the centre as possible, unless on the slope of a hill, when it should be nearer the top to save the uphill carting of manure. In dairy farms, however, the buildings should be near the centre of the pasturage part of the holding, so as to avoid fetching and feeding the cows from long distances. And further good points one might look to find in an ideal home-stead would be a dry, healthy soil, easy drainage, and a sheltered southern slope. The best aspect for stock is no doubt south with a touch of east in it; but when building on a slope, unless the aspect is utterly wrong, the building should perhaps be placed across the direction of the slope, or some very awkward steps will have to be dealt with. Finally, in rebuilding old home-steads—and in England most of our work must be with such—do not accept it as an axiom that they should be rebuilt on the old site. Some of the foregoing advantages should be looked for on the holding, and if found in greater measure at some other point, rebuild your homestead there. Do not be afraid of leaving one or two buildings too good to be pulled down isolated; they will prove useful for a variety of objects. And now, having to erect a new homestead, what should be its arrangement and construction? It should be built with an eye to careful economy of construction and maintenance, in the most labour-saving and convenient manner possible; but, above all, it should provide for the most suitable and sanitary housing of livestock. I have never seen any group of buildings for a mixed farm even when I have visited so-called "model" buildings, which were not teeming with defects. I have not come with any perfect plan, but I believe that it will be found somewhere between the two extremes, presented by the old-fashioned and modern or "model" homesteads.

HOMESTEADS: ANCIENT AND MODERN.

But perhaps it would be most helpful to glance at the advantages and disadvantages of both. In an old homestead there will generally be a large rambling old barn of flail-threshing memory, with perhaps the cowsheds ranged about same; then the stables will be in an entirely separate block, the piggeries in another, the granary, chaff-cutting house, and cartshed in another, and various outlying loose boxes and small cowsheds wherever there is an odd corner. In addition to this, the yards are nearly always of a much too large a size, rain-washed and wasteful of litter,

all tending to the making of bad manure, whilst apparently the aspect was rarely studied at all. This is obviously not of a labour-saving character, or suitable to the modern practice of farming. But to turn to the modernised type, which common usage designates as "model." Here all the buildings, even down to the fowl-house, are grouped in one large parallelogram, the outside walls of which arise square and gaunt, with scarcely an opening to be seen. I am not urging its ugliness, though I believe it to be the outcome of one of its most practical defects, namely, that everything is approached from within, frequently from internal roads and alleyways. Were it situated on some of our blackest wold lands I should find excuse in the pitiless winds and rains which drive across them; but why when on some sheltered hillside or sunny valley? It does not save roadways, the sparse openings are distributed on all sides, and they must have approaches, so the system is even wasteful of cart-way. I cannot believe, either, that the buildings so grouped can be as healthy and sanitary as those built in more open formation. The internal alley-ways also make independent walls just as necessary as they are in more open formation, so there is no economy effected in construction. In case of fire, too, the whole range of buildings is endangered, and unless the removal of the stock was undertaken early in the conflagration many must inevitably be lost.

IN DESIGNING A COMPLETE HOMESTEAD

myself I should certainly have as few internal approaches as possible, but everything, as far as possible, approached from a common farm road-way, and whilst grouping the cowsheds, stock-yards, and piggeries under the shelter of the barn, granary, &c., keep the horse yards, stables, and cartsheds distinct. The staffs that work these two departments are entirely distinct, and if over the cartsheds a roomy loft was constructed, into which a stack could be threshed direct, the extra labour involved is nothing. But I will proceed to the

PRACTICAL DETAILS

in connection with the various buildings. All repairs should be capable of being undertaken by the estate carpenter, or else whatever is broken or missing is sure to be neglected till some serious mishap arises through it. For this reason, and for the reason that on most estates enough timber is felled and steam-sawn sufficient for the purpose of repairs, I am strongly in favour of the simplest wood construction in everything but the main fabric.

STABLES.

In cart-horse stables, it is very desirable that each horse should be provided with a separate division, which must in no case be less than 6ft. wide. In old-fashioned stables it was not at all unusual to find all the horses standing together with no divisions between, but this is much to be regretted. When farmers shrink from what they consider extravagance, perhaps, the best compromise is to divide up for pairs, the divisions with 10ft. centres, and the weak horses can then be put together. The width of stable may be arrived at by allowing 2ft. for manger, 7ft. for standing, 12in. for gutter, and 5ft. for passage-way behind. The cubical contents necessary, 800ft. per animal, applies to both stables and cowsheds. No general rule for determining the number of horses required to be provided for can be given. Roughly speaking, a horse to every 25 acres is what is generally needed. The manger should be of 1½in. plank, and about 3ft. high, with stout, rounded, hardwood chin-piece, preferably in oak, as the acid in this wood makes horses averse to crib-biting. The divisions should have hardwood heel posts, 1ft. in front of gutter and 5ft. out of ground, with all the arrises taken off, as should be done to all fittings, and the boarding to them may be 1in. rough, but in any case should not be tongued, neither tongued into the rails (as this makes repairs difficult at once), but nailed one side only, and kept off the ground to prevent decay. The doors should be 4ft. wide, and at least 7ft. 6in. high in two heights, and capable of being hinged right back and there fastened, as should all farm doors, whilst the windows should be of the hit-and-miss pattern, with glazing over, unless, having a lofty stable, you can put your light in front, but well above the horses' heads; or, better still, can bring yourself to put plenty of glass tiles in the back slope of the roof, than which there is really no better way of lighting (at all events for cowsheds) or of avoiding breakages. But

unless the roof is pantiled and glass tiles are being used, large sheets should be employed, as every joint forms a lodgment for dirt, and obstructs the light. For the paving in stables, a very hard brick will be required, or the iron-shod feet of the horses will make short work of it. Blue bricks on edge will make the cheapest efficient paving, or there is a red brick made at Skier's Spring, near Barnsley, which I believe to be just as good. The fall would be at least one in forty, and the gutter can best, perhaps, be made with bull-nosed bricks, and of sufficient width to allow free passage of a shovel. To insure the all-important ventilation the best and safest form is still that employed by our ancestors—namely, carrying the eaves well over, leaving out all filling between the rafters' feet, and raising every fourth or fifth ridgetile. A fodder and harness-room combined should be in connection with the stable, and approached from same. A small compartment opening out of same for chaff is a great convenience. Lofts running over the stables, with arrangements for bundling the hay down into overhead racks, are to be condemned on every score. To form side racks to mangers, the chin-piece should be carried through, bars let into same and carried down on to a brick pinning about 9in. high, and the bottom sloped up to the back so as to let out all the hay-seed and dust. The stables should have direct access to a horse-yard, with shelter-sheds in same, in the construction of which it must be remembered that the manure is allowed to accumulate to a depth of about 2ft. before removal, so that the eaves must be kept high enough to allow of it, and for the horses to pass beneath, about 8ft. is usual. They are often also made far too shallow, so that little protection is afforded the animals: 14ft. must be the minimum depth, and 2ft. or 3ft. more may be added with advantage. All the eaves should be spouted to prevent the manure being more rain-washed than is necessary, but I would not advocate horse-yards being entirely covered. In all shelter-sheds, cart-sheds, &c., where one has to employ posts let into the ground to take the roof-plates, one is troubled with the constant annoyance of rotting feet, and the attendant necessities of spurring them. I have seen various attempts to obviate this. An ingenious one, based on the fact of posts always rotting at the ground level, was to set them in a drain-pipe, the top of which was kept 6in. above the ground and filled in with cement; but the best is the use of steel joists bedded into a block of cement, and attached to the roof-plates with angle-irons, but should these be used, there must be bolted to both sides of the web, at least for a height of 6ft., a chamfered block of wood, or serious injury may happen to the animals. Cast-iron columns ought never to be used owing to their liability to fracture. The gates of all yards should be 10ft. wide, and hung to open outwards and fall right back. When there are gates between two yards they must be hung at least 2ft. up to clear the manure as it rises; and so, if the yards are ever to be used for pigs to run in, the bottoms must be fitted with elm slips, constructed like miniature gates, to work in grooves formed in the gate-posts. Palings make very bad fences between or around yards, but should they be necessary on the score of economy, do not point the tops, and let them be close, or an animal may get hung up and seriously damaged. For the same reason, keep the top rails of gates close enough to prevent animals ever getting their heads through.

COWSHEDS.

In treating of cowsheds, we come perhaps to the most important buildings which go to make up a homestead. Two kinds of sheds are in common use—those for single rows of cows and those where they stand double. No preference can be given to either system, except that in the latter, for a large number of cows, it will be cheaper if the building stands independently, as then one roof takes the place of two; but generally it is possible to arrange some of the sheds as lean-to's against a barn or some higher building on the north side, thus giving them welcome protection and making quite economical the roofing of a single shed. In a shed in which there are two rows they may either be arranged head to head with the feeding passage in the centre, which is perhaps most convenient, or tail to tail, with the dunging passage in the centre, and the feeding passage on either side; but as far as space is concerned, neither of these arrangements

is more economical than the other, as may be deduced from the following figures:—The feeding passage must never be less than 3ft. in width, the manger will take up 2ft., the standing 6ft. 6in. from manger to edge of gutter; the latter must be 12in. wide, and the dunging passage at least 4ft. I know to some the above length of standing may seem short; but should you make it more the cow will be nearly certain to foul its bed. I would even advocate a still shorter standing for Alderneys or other small breed of cows. It is usual to tie the animals in pairs, in which case the divisions need to be with 8ft. centres; 6in., or even 12in., less is often given this, but it leaves the cows very cramped, and also hampers the milkers. The divisions may be constructed in much the same manner as those described for stables; but the heel-post is better not so far back, or it will get in the way of the milker. It should certainly be 2ft. in front of the gutter and only about 3ft. 6in. high, whilst if it rises to 5ft. at the manger it will be ample. The construction of mangers is important, but little understood. Each cow should be provided with two bins, which means four bins in each of two-stall divisions, each bin capable of holding a bushel easily, and the bin next division in each case fitted with ventilated lid to hinge back and fix with button against it. The height should certainly not be more than 1ft. 9in. As to the depth, the usual custom is, for its ease and construction, to use an 11in. plank for the sides. They should be constructed of 1½in. plank, and the back plank, at least, should be well canted. Of course, no chin-piece need be provided. There will, however, want to be a support half-way between the divisions. How to prevent the cows pushing out the food into the feeding passages is a very difficult problem, and one which I have never seen satisfactorily solved. If you put a roll edge or projection at the back it would prevent a large-horned cow from getting at the bottom of the bin. If you can spare the room a ledge at the back with small curb or a canted plank is best. Far away the most common mistake in cowshed construction is the paving of the whole area up to the manger, and letting there be a continuous fall from manger to gutter. As to the paving of cowsheds, if it were not for the expense I should use V-grooved bricks, the grooves running only in the direction of the fall, as in economising litter it is very necessary that the liquids should pass rapidly to the gutters; but as a cheap paving I do not suppose a good bed of cement concrete finely faced can be improved upon. The gutters are very important, as in all districts the local sanitary authorities are now empowered to control the construction of cowsheds, and they will not allow any covered drains, but insist on the open channel being carried right outside the shed a distance of 12in. before the liquid manure is disposed of in any way. Long lengths are thus made necessary, which should clear themselves with a small flow as rapidly as possible. The standing next gutter should be terminated with a stone slab slightly rounded on edge; and the dunging passage, which is all at a lower level, should be sloped to same with a steeper incline as it approaches it. The paving of the feeding passages may be of rammed chalk or clay, unless trolleys are to be employed, when a concrete floor is necessary. The width of the door to the cowshed should, I think, be about 3ft. 9in. to 4ft. The sheds will naturally be built adjoining the yards, and unless you have covered yards with only dwarf walls between them and the stalls, it will be found convenient to have low doors somewhere at the ends of the sheds, opening into the yards, for throwing out the manure (the space beneath the windows can generally be utilised). Provision for calves should be made in conjunction with the cowsheds. Calving-boxes should have at least 180sq.ft., and, if drained, the floor should but slightly fall all one way to a gutter underneath one of the divisions kept up for that purpose; no gutter or other irregularity of the floor must be allowed, and a rammed chalk floor is preferable. The angles may have racks and mangers fitted across same. Bull-houses should be entirely independent, and open into stockyard. Mention should be made of cattle-boxes for fattening beasts. Eighty feet to 90ft. super is allowed for each box, and they should be built in ranges, divided by gate-like divisions capable of rising with the manure in grooves on either wall, and entirely removable. In constructing covered yards, 160ft. super should be allowed per animal. Free

ventilation should be provided in the roof, which should be of one span, and the gable ends should be covered in. Coming to what may be termed

THE ADMINISTRATIVE BLOCK

—namely, that which contains the straw barn, food stores, &c., this is generally a two-storied building stretching east and west, with the stockyards, &c., grouped and sheltered under it on the south, and the stackyard on the north. The food factory thus comes in its rightful position, between the food to be consumed and the consumer. The straw-barn now does not want to be of the size of the old threshing-barns, but only commodious enough to store about one day's threshing. It should be carried up the whole height, and have large doors 14ft. high for access, whilst, if possible, it should be arranged so that waggons can pass right through and out the other side through one of the stockyards. The floor may be of concrete, but the cartway would soon be broken up if of this material, and may best be made of wood. Next the barn is generally placed the mixing-floor, with the root-store adjoining, and only divided by a dwarf wall. Both these departments should have wide doors, so that carts may back right in. Over these departments are placed the cake-room, with its crushing machine and chaff-cutting machine, with their shoots to the mixing-floor, and beyond the granary, all connected together together for the convenience of trucking right through. The floors of these upper departments should be grooved and tongued, any skirting should be in cement, and the end of all joists and the spaces above roof-plates filled up solid, and the ceilings should not be plastered, lest there should be any hidden harbour for vermin. The roofing to these buildings must be quite weather-proof, and pantiles are not sufficiently so. It is difficult to give an exact rule for determining the size of a granary, but they are very useful of a good size, and 2½ft. super. per acre should be the minimum.

DUTCH BARN

are very deservedly growing in favour amongst farmers; their cost of construction is so little, and their usefulness so great, that they must be a good investment. Not only is all the cost of thatching avoided by their use, but in wet weather loaded waggons can be drawn beneath, and ricks dry much better under them owing to the free passage of air over the top. The waggons draw between the bays, so that these should not be less than 12ft. in width, and as cost is the only thing which governs the length that they may usefully be made, any multiple of that figure will do; whilst to admit of topped-up waggons passing through, they should be 14ft. high to the underside of plate, and, to afford protection to the load, they would best be 20ft. wide. As much space as possible should be left in the roof, and the whole fitted with gutters and down spouting, with the gable ends closed in.

CALTSHEDS

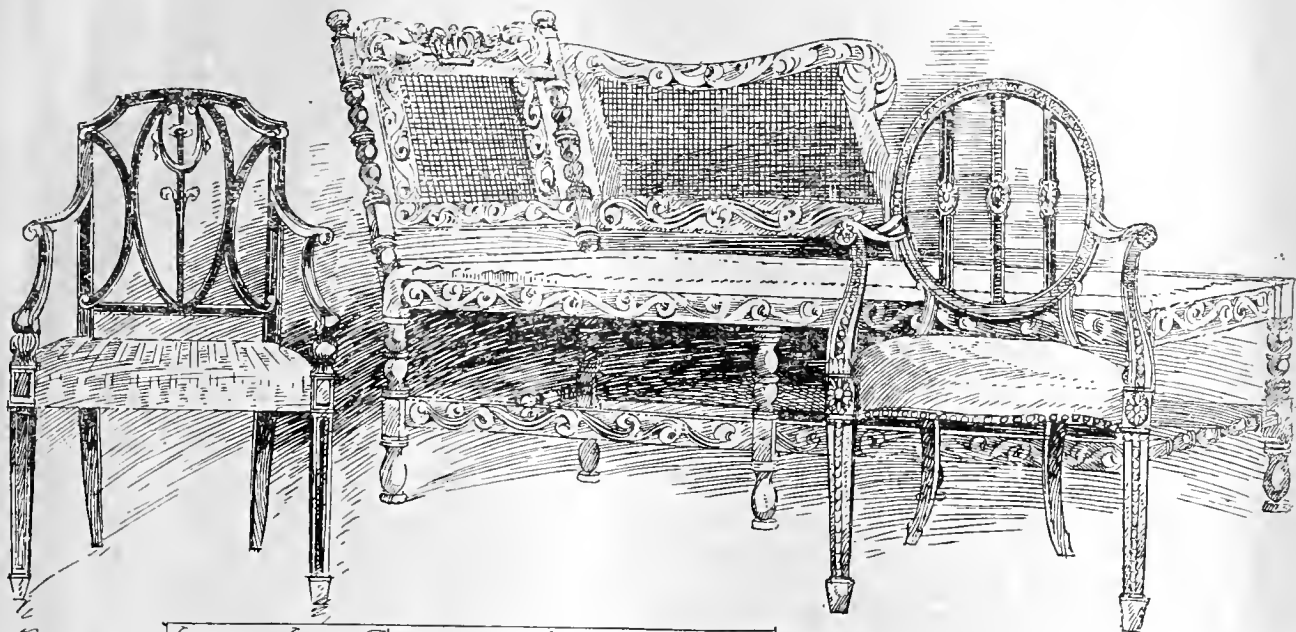
should, if possible, have a north-east prospect, and the openings not less than 9ft. in the clear; the height of these should be not more than 8ft. in order to keep out the weather as much as possible. As to depth, a single waggon or two tumbrils will require 20ft., but 30ft. will accommodate two waggons or four tumbrils. Knocking-stumps should protect the posts at entrance, and a guard-rail should be placed in front of the back wall. An implement shed for the more expensive implements is necessary, and should have an opening 10ft. wide, with doors to lock up, and provided with windows. If a toolhouse is provided—and it is very useful for storing ropes, rakes, forks, &c.—it may be best placed in conjunction with this. Before designing

FIGGERIES,

some thought should be given as to whether they should take the old form of covered sty and run, or the more modern box or pen. If the former is adopted, the chief necessity is to keep the covered lodging well above the level of the run to insure its being dry. But I would rather describe the boxes, as I believe them to be most useful. They should, if possible, be placed adjoining the stockyard. The boxes should have an area of from 80ft. to 90ft. super., with perhaps one or two rather larger as farrowing pens, and be separated by walls about 4ft. 6in. high. If a feeding-passageway can be provided at the back leading to the boiler-house at the end of the range, it will make a most compact department. A further labour-saving device will be to

SALE ROOM SKETCHES

FROM MESSRS FRANCES ROYAS



CHARLES COUCH ADAM AND SHERATON CHAIRS

C. I. M.

have the feeding-troughs midway between the pen and the feeding-passage, with a swinging shutter hung centrally above same, so that it may be bolted on the pen side in filling the troughs, and then swung back and bolted next the passage, throwing the whole into the pen. A guard rail 6in. wide and 9in. above floor should be placed round the farrowing pens. Pigs will soon rout up a brick floor, and I believe the best is again concrete, cement faced, as this is more impervious. The boiling-house should provide accommodation for several meal and swill tubs, and have a good-sized copper and furnace fixed in it. One or two good-sized loose boxes on the premises will be found useful for foaling and to act as sick boxes. Permanent sheep-folding yards are now acknowledged as a mistake, and become obsolete.

DAIRIES.

A housewife's dairy should have its main window north; but to get a fresher current of air I like another window east or west, which can be sheltered by bushes grown outside should it prove too hot. The walls should be hollow and the roof of thatch or plain tiles—certainly not slated. A settling-room should be provided with wide slate shelves around the walls, but not close up to same, a little space being left for the freer passage of air about the pans. It is customary to whitewash dairies throughout; but the whitewashing had better not extend down to the shelves, or, the pans being pushed carelessly back, will flake it off, and give you the real comic-paper article of milk with chalk in it. Two rows of any kind of tiles will obviate this. It is impossible, of course, without artificial heat to maintain a temperature of 58°, but this temperature should be striven for as nearly as possible. The butter-making department must have no drain inside the building; but the floor should slope to a channel outside, conducting into a gully. The ceilings in all cases must be ceiled, and everything conducive to the greatest cleanliness. The gauze should be on frames fixed outside the windows and easily removable for cleaning. As to

FARMHOUSE COTTAGES.

I will content myself with throwing out only two or three hints for your guidance. Do not waste your clients' money in providing a second sitting-room and laying on hot and cold water for a farm of a hundred acres. It will never win a tenant from the class of men who would wish for so small a holding. On the other hand, you will never get a tenant for a farm of larger acreage

unless most of the luxuries to be found in a modern two sitting-room house are present. Do not again, in striving after compactness, put your house so close to the stocksheds that after its erection one or other is proclaimed by the sanitary authorities uninhabitable. There is in this country a very tender bias towards progressiveness, so that in twenty years' time it may be deemed necessary to have the malodorous pig-sty fifty yards from the dwelling-house instead of thirty, as at present. Finally, in labourers' cottages do not put in less than a 2gal. copper, or they will not be able to brew enough to fill an 18gal. cask at a time, a serious inconvenience.

A vote of thanks to Mr. Cautley for his interesting and practical paper was proposed by Mr. H. P. G. MAULE, and was seconded by Mr. R. H. WAYMOUTH. A discussion followed, in which Messrs. C. H. HOOPER, HENRY TANNER, jun., G. PECHILL, W. A. FORSYTH, F. C. MEARS, and the CHAIRMAN took part. The vote of thanks was heartily accorded, and was acknowledged by Mr. Cautley.

DRAWINGS OF VENICE.

AT the Modern Gallery, 175, Bond-street, a collection of water-colour drawings and sketches by Mr. George C. Haité, R.I., R.B.A., entitled "Venice: Colour and Sunlight," are on view. Mr. G. C. Haité is a master of rich colour and sunlight effect, employed with a breadth and vigour well known to admirers of his work. We have before noticed these qualities, and in the drawings and sketches of Venice they are eminently true to nature. It would be impossible to do justice in a brief notice to the many works on the walls. Such small sketches as "Shop Doorway," "The Hay Barge," the quay scene (3), "The Bootyard, Rio Trovaso," are delightful studies of colour. In the latter work, and in "Fruit Stall, Murano" (5), "A Street" with three stalls of vegetables and fruit, and in several other studies we notice the painter's spontaneous methods as simple delineations of form. Other subjects of the same kind are "The Lido," with its foliage and water, and the glitter of lights on the latter; "Fruit Stall, S. Polo" (12), "The Market Boat," "Murano" (18), and many studies of St. Mark's and its piazza, so well known to the admirer of Venice. "The Glowing West" (16) is a gorgeous sunset, with crimson sky. We can only refer to the fine drawing, "The Lattere" (30), showing the portico of a church. This promenade has a fine

prospect upon the broad canal of the Giudecca, a scene dear to painters of sunsets. "The Piazza, St. Mark's" (52), "View from the Riva Schiavoni" (69), "The Giudecca," a view of the island and lagoons, with its stalls under awnings in depth of shadow, and the light on the gleaming fronts; "A Street Scene," "On the Lagoons" (49) are all charming sketches, of rich colour and sunlight. One of the finest and most finished works is "Under the Archway" (92), an arched recess, with fruit and flower stalls, above which is the upper-story window, with pendent national colours, very rich in colour and handling. The pencil studies, as "Fishing Boats," "A Study of Vegetables"; the fruit-stall studies in pencil, thinly tinted, are instructive examples of Mr. Haité's method. We recommend all lovers of Venetian scenery to visit Mr. Haité's marvellous studies in colour and sunlight.

SALE ROOM SKETCHES.

THESE three pieces of furniture, consisting of a Charles I. couch, a Sheraton and Adam chair, were recently sold at Messrs. Frances and Sons' Rooms. The Sheraton Chair, of mahogany with finely carved oval back and arms, on fluted legs, changed hands for £9. The Adam Chair, also in mahogany, one of a pair, fetching £15 10s., whilst the Couch, in oak with carved shaped head and back, on turned legs and stretcher, was sold for £9 10s.

INDUSTRIAL DECENTRALISATION.

AT the ordinary general meeting of the Surveyors' Institution, held on Monday evening last, a paper was read by Mr. Herbert T. Scole on the above subject, which the author well described as "an important factor in the solution of the housing problem." The President (Mr. Albert Bush), having recovered from his temporary illness, occupied the chair.

The author, premising that the subject was too vast and complicated to be dealt with in all its aspects, and especially from a historical point of view, proceeded to criticise some of the literature which had recently been disseminated bearing on the subject of industrial redistribution and the rural housing of town workers. It was argued by one writer on the subject that, in existing circumstances, labour was less efficient than it might be, that the stamina of the people was being reduced, and that, owing to municipal

monopolies, &c., the conditions affecting our manufacturers compared unfavourably with those in force with our rivals overseas. Some of the proposals of the "Garden City" scheme were severely handled by the author, who, while claiming to be in entire sympathy with the philanthropic aims of the promoters, could hardly consider all the details of their projects practicable. The "Grand Avenue," 420ft. wide, which was to traverse the city, sounded splendid, but these tremendous streets would cost a fair sum annually in maintenance. The circular railway, on the outskirts of the town, seemed rather less practically useful than if it could have served both sides of the town. It was not quite clear on what basis the original outlay on any individual holding was to be calculated; but the sites for factories were to be leased at £2 per employee, the home building lots at £6 each, and the agricultural portion at probably nearly £2 per acre. The building lots were to be 5,500 in number, and with an average area of 20ft. by 130ft., which at the rate given, 5½ inhabitants per lot, would work out at about 92 per acre: a fairly crowded population to begin with. One writer gave details of the system of water supply, by which all the spoil from foundations, building lots, factories, subways, &c., was to be thrown up into a huge retaining embankment of a great high-level reservoir 140ft. high. The cost of this Mr. Seeble reckoned, taking a low figure per cubic yard for moving, embanking, &c., at more than the total capital of the company, no account being taken of wells, pumps, windmills, steam engines, mains, machinery, service reservoirs, &c. On the whole it was easy to become enthusiastic on the housing question and to arouse sympathy by a recital of present woes and imaginary future bliss; but he feared the business side of the matter was too often relegated to the background. Proceeding to discuss the disadvantages of town houses, the author said these were sufficiently obvious. The cost of land compelled high buildings, whether for factories or dwellings. Rates were high, and the rateable value was also excessive, insurance was costly, not only on account of the height of the buildings themselves, but also of their close proximity to other premises. Delays in the transmission of goods, in or out, were frequent, and any enlargement of premises was often impossible. Water was an item of expense, and the disposal of trade refuse often a great difficulty. On the other hand, in the country land could be bought cheap, buildings could be made more spacious, lower, more widely apart, and consequently, cheaper, safer, more commodious, and more healthy. Insurance was lower, delays in transit less frequent, and any extension was easily accomplished. By choosing the site judiciously, cheap power and abundant water could in most cases be obtained, and, as a rule, trade refuse was more easily disposed of. Of course, there were cases where expense of distribution was heavy, quickness of execution of orders necessary, or, under other conditions, a central factory was most advantageous. Again, some industries were capable of absorbing large quantities of surplus produce of a perishable nature, and in such cases proximity to a central market was an advantage. So far as labour was concerned, high rent, overcrowding, absence of light and air and playing spaces for the children made town life unhealthy, unattractive, and, from a public point of view, dangerous to the community, and even in the model dwellings, where the overcrowding per room was avoided, the overcrowding per acre (sometimes as many as 700 per acre) was, if less apparent, at least equally dangerous. Clare Market had been rebuilt at a cost of £220,000 for 750 people, or about £300 per person, and if such an expenditure did not produce a fair return, the employers of labour in the vicinity of such publicly provided dwellings were surely being unfairly subsidised. In the country, a house to himself, a garden or allotment, and the enjoyment of sunlight and pure air, presented a happy contrast to the lot of the town worker. Tram, train, and cycle kept the artisan in touch with the town. The man was more with his family, his children were better, morally and physically, and he found healthy and even remunerative occupation for his leisure hours; and the general experience was that a man who had lived in both town and country would seldom be willing to exchange the latter for the former, though in exceptional cases the opportunities of employment for the junior members of the family and the proximity of technical schools and classes

inclined the artisan to prefer town to country. Many large firms—printers and engineers and others—had already migrated from town to country, and many more were on the move. Firms whose names were household words had laid the foundations of gigantic businesses in factories surrounded by the homes of their employes, designed and controlled under almost ideal conditions of health and prosperity. The settlements of Lever and Cadbury at Port Sunlight and Bournville were well known, and, as the author showed, under judicious management, were not only prosperous, but even commercially remunerative, while the dwellers enjoyed privileges of which the town-dwelling worker was ignorant. Among the factories which had for various causes migrated from London to the more open country, Mr. Seeble gave brief details of Messrs. Ransome and Co., Ltd., who, having been crowded out in Chelsea, had moved to Newark-on-Trent, with immense advantage to their working and their workers. Then he described the works at Lewisham, whither Messrs. Elliott Bros. had gone from St. Martin's-lane. In both cases one-floor workshops were the rule; overcrowding was avoided, driving-power was economised, and risk from fires so appreciably reduced as to effect a considerable saving in the cost of insurance. The model villages of Port Sunlight (where Messrs. Lever Bros.' workpeople were so comfortably housed) and Bournville (built by Messrs. Cadbury for the accommodation of their own operatives and others under healthy conditions and amid pleasant surroundings) were typical instances of what might be done by skill, consideration, and the judicious expenditure of capital. "Prosperity sharing" between master and man was a name well given to such an enterprise, for while the worker was in every way benefited, it could not be doubted that the master reaped the advantage of better and more willing work, less loss from sickness, and a more than commercial return on the increased efficiency of labour. At Port Sunlight, about 600 houses had been erected, the rents ranging from 5s. 6d. per week, including rates; and allotments, close to the cottages, could be had for trifling rents, including use of water. The general arrangement was in groups or blocks, with paved yards at the back, and small gardens in front, kept in order by the firm. Some £350,000 had been spent, including institutions, clubs, roads, parks, &c. At Bournville the cottages, which let at a rent of from 5s. 6d. per week, have large gardens at the back, with fruit trees planted along the intersecting boundaries, the dwellings occupying one-fourth of the sites on which they stand; while factories and shops are limited to one-fifteenth of the whole area of the estate. The 43½ acres under cultivation have been estimated to yield some £59 per acre per annum, or more than six times what could be expected from the land under ordinary agricultural cultivation. In this connection the author gave instances of the happy results which have accrued in the case of dairy management under minute personal supervision, such as was possible in communities similar to those with which he was dealing, and stated that one of the consequences of the cultivation of the soil by artisans and factory hands, each working his own garden or allotment, would, he hoped, be to supplement the foreign producer of vegetables, fruit, poultry, and eggs. By "intensive" cultivation, and the scientific and business conduct of farming and market-gardening, it might be possible to obtain a profit which would admit of the payment of wages favourably comparing, when all was taken into account, with the earnings of factory hands. In conclusion, he stated his belief that a very considerable movement of factories from congested areas to rural and suburban sites might very shortly be expected, and would demonstrate the enormous advantage to all concerned of the housing of the workers in the best practicable manner, and that the solution of the "housing problem" was to be found, not in municipal or philanthropic effort resulting in the erection of more and more dwellings in the large towns, nor in the increase of transit facilities, but in the establishment of country factories and model villages.

TECHNOLOGICAL INSTRUCTION.

THE teaching of technology is now a recognised branch of education. Since the Education Act of 1902 was passed great encouragement has

been given by the Board of Education to this subject. The report on the work of the department for the last session has been issued, and contains many interesting facts regarding the work. Attention is drawn to the arrangements made for grouped courses, and the substitution of attendance grants for those on examination results. By this course greater freedom is given to schools and local bodies in selecting subjects of instruction suitable to the trade of the district—a most important action, which has resulted in an increase in the number of technological classes and the number of students. Thus, we are told, registered classes have increased from 2,320 last year to 2,789 this year, and the number of students from 36,189 to 38,638. In the normal classes in woodwork or metal work, the students attending with a view to the teacher's certificate have increased from 1,908 to 2,367. Other figures given are certainly conclusive of a rapid increase. Effect has been given to the arrangements for co-ordinating the work of the department with that of the Board of Education, by which the entire work of a technical school, whether in science, art, or technology, is taken into consideration in the assessment of grants. The overlapping of subjects of examinations found to exist in some syllabuses has been to some extent prevented. Thus some of the examinations of the Board overlap those of the City and Guilds of London Institute; but these refer to a different class of students. The advantages of co-operation between the Board and Institute have been referred to by Lord Londonderry, Sir William Abney, and others; but we refer the reader to the report itself. The Institute has done a great work, it has rendered a useful service in the guidance of local efforts, which are of value to our great industries. The Scotch Education Department, the Department of Agricultural and Technical Instruction for Ireland have availed themselves of the Institute's services. Several tables are given showing the development of technological instruction, the results in separate subjects. In the building trades, mechanical and electrical engineering, and textile manufactures, the increase of candidates has been considerable. The largest number in any one subject is in electric lighting. In carpentry and joinery there were 1,729 candidates, in plumber's work 1,479. Looking over the tables and the reports of the examiners, it will be observed that the most evident faults in the written parts of the examinations are due to defective school training—"to the students' imperfect knowledge of the elements of physical science and of drawing, and to their inability to express their ideas in written language. This is the general burden of the complaint." No improvement in the answers is looked for until the teaching in elementary schools is more practical, and more attention is given to drawing and scientific method, and English composition. The power of expression involves clearness of thought—almost as necessary to the artisan as technical skill. The failures in the preliminary examinations are due to this cause. The percentage of failure is very high in electrical subjects, such as the wiremen's work. The remarks of the examiners given in the volume before us are instructive. Referring to this special work, the examiners say: "In the majority of specimens (metal joints) sent in for examination, insufficient attention had been given to effective insulation. From the way in which prepared tape was used by most of the candidates, it seems that they regard such tapes as an insulator, whereas it should only be used as a mechanical protection. Non-removal of tape from the original rubber of the cable, before insulating the joints, was the cause of many failures." It is important, as the report says, from the view of the insurance of buildings against fire, that a high standard of qualification should be required. In regard to plumbers' work the same fault is found; grasp of the rudimentary principles of science underlying plumbers' work is still far from satisfactory, and shows the inadequate school training of apprentices who enter for instruction. Candidates for examination in mechanical engineering have increased, but the failures are high, and the examiners attribute these partly to attempting to pass in the same year two parts of the examination in the ordinary grade. A large number succeed in Part II, who fail in Part I., where the questions relate to mechanical principles, bending moments and shearing force, and to various definitions of stress. We can only notice a few of the other subjects as mentioned by the examiners. Brickwork examinations show a lack of observation;

as to No. 2 question, it is said that many candidates make the mistake of putting the thicker wall outside. This presumably applies to cavity walls; if so, the point is at least debatable. The thicker wall outside gives some advantages: deeper reveals, greater strength to resist external violence, and better means of bonding. In masonry the ordinary grade answers were fairly good, but the honours grade papers far from satisfactory. Drawing is also weak. In many instances elementary knowledge of solid geometry is very imperfect. In other trades the results show a want of more thorough study of elementary facts and principles. In builder's quantities the number of candidates has increased. Much time has been wasted by squaring dimensions, abstracting, and billing, so that less time has been bestowed on other subjects. We must reserve our remarks upon other portions of this report, which contains many points of interest. A large portion of the volume is occupied by the questions set in the examinations, which are instructive. Many of these are illustrated by diagrams. On the whole, the results are satisfactory; but the general complaint of the examiners is the same—that the candidates show an inadequate general knowledge, and few have grasped the whole field covered by their subjects, they are deficient in the power of expression, and careless in reading the questions.

LOCKS AND LOCK FURNITURE.

A NEW illustrated lock and furniture catalogue has just been published by the eminent firm of Messrs. Hobbs, Hart, and Co., Ltd., of Arlington-street, Islington, and 76, Cheapside, so well known for their manufacture of every kind of mortise, rim locks, lock furniture, strong rooms, and safes. This company are the patentees and manufacturers of so many lever and protector locks of every description that a simplified arrangement, by which buyers can select and describe the particular class, quality, and price of every article, has become essential, and for this purpose they enumerate the registered trade marks. This is necessary, because of the many imitations of the goods, of good external finish, but devoid of the qualities of security and wear. Hobbs and Co.'s patent Protector locks "combine the principle of lever security against the use of any but the true key, of the movable stamp security as a protection against picking, and the revolving nozzle security as a protection against fraud." No lock is really secure without these three ingenious essentials, which are described in detail. Those in search of a lock secure against picking and fraud will find a careful perusal of the pages of this catalogue amply repay them. We can only glance over the numerous examples of the company's Patents, Protector and Lever locks, and specialities. The "Lever" machine-made locks, depending on a series of levers which require to be raised to unequal positions, according to the steps of the key, are perfect in their mechanical arrangements. By means of change of key-cutting machines, immense changes of key differences are insured. On page 8 we have a list of patents having relation to improvements and inventions in locks and lock furniture, safes, doors, &c., which show a great variety of effect, to meet numerous requirements in the arrangement and construction of locks and fasteners for all purposes. The selection of presentation keys in gold and silver manufactured by Hobbs, Hart, and Co., from special designs, and of fancy bow keys for mortise and rim locks are very interesting from an artistic point of view. Thus we see the Constable's Key, Tower of London; the Westminster Town Hall presentation key; Art School, Sheffield; and keys for various other municipal buildings. Special sets of locks for hospitals, infirmaries, &c., are illustrated. These are made to differ, singly or in sets, as required for male or female sides, stores, medical and administrative departments, with sub-keys to each set, and with master keys to pass, &c. Then we have locks on suite for hotels, mansions, public buildings, each lock having its own key to differ with sub-master's keys for certain respective floors, and master keys to pass all. Mortise and rim locks are made to order in sets, and may comprise two-bolt locks, dead-locks, and latches. Illustrations and descriptions of mortise-locks, the "Cheapside" lever one-bolt mortise, two and three-bolt mortise locks, will be found of value in specifying. The former is a moderate-price and excellent mortise,

described as "6in. by 3in., two brass bolts, brass bushed follower, one key," priced at 5s. 3d. each. The particulars and plans given for ordering locks, whether right or left-handed, and the way the door opens, are, of course, very necessary to be observed. The "one-bolt mortise lock" is made with full lever security for use of knobs on both sides, the keys locking up the bolt internally. These are priced from 4s. 6d. to 8s., according to number of levers. The "Universal" 4-way mortise locks, by which the latch bolt can be actuated by turning, by pressure, or by lifting knobs, are ingenious, and afford facilities for opening and closing door of dining-room, &c., while both hands are full. Several kinds of "lever and patents protector" mortise locking catches are illustrated and priced of two qualities; these are suitable for street doors for mortising in the middle rail. The flush drawback night latches and locking latches, and the jannaped lever and "Patents Protector" rim dead locks are of superior make. The "Patents Protector" and lever mortise combination bolts and locks adapted for doors of banks, warehouses, &c., offer great security as the bolts are thrown up and down, as well as into the frame. Hobbs and Co.'s "Violence Protector" locks for safes and strong-room doors are perfectly devised mechanical arrangements, providing a series of movable retaining stumps, any one of which would retain the bolt in position. We also notice Hobbs' "Patent Bankers' Protector Treble Action Transmutation Key Locks." Other pages of this useful catalogue illustrate locks for wardrobes and cabinets, patent slotted steel spindle furniture, knobs repousse, and other lock-plates and finger-plates of artistic design, door handles, and many other descriptions of furniture and fastenings. We recommend the architect and builder to consult this excellent catalogue.

IRISH BUILDING STONES.—III.

CLARE.

THE rocks in this county are Lower Coal Measures (Millstone Grit) 290, Upper Middle and Lower Carboniferous Limestone, Lower Limestone Shale, Old Red Sandstone; Upper and Lower Silurian, Trappean Ash, Greenstone, Diorite, and other Igneous rocks. In the Limestone series there are beds of Magnesian Limestone deposited as such, and Magnesian Limestone, which is only Metamorphic Carboniferous Limestone: in neither case does the limestone so classed belong to the Permian rocks. Ennis is built on Upper Carboniferous (Burren) limestone; Kilkee on Coal Measures; Kilrush, Coal Measures and alluvium; Killahee, Old Red Sandstone, Alluvium, and Silurian rocks. Carboniferous Limestone and Millstone Grit cover the whole area of this county. A line passing nearly due north and south, about five miles to the west of Ennis, roughly marks the boundary between them, the Millstone Grit occupying all the county between that line and the Atlantic Ocean, extending from the barony of Burren to the mouths of the Fergus and the Shannon. The newest rocks in the county are the Lower Coal Measures or Millstone Grit, and they yield valuable building and paving stones all over the district indicated above. The most important quarry, or rather series of quarries, in these rocks are now worked by Messrs. Watson and Son, Ltd., of Tower-buildings, Liverpool, and they furnish stone which the proprietors describe as "clean, hard grey Millstone Grit." It belongs to that division of the Clare Carboniferous Sandstones known to geologists as "Clare Flags." This particular sandstone is nearly pure silica—that is, the material is built up with grains of silica imbedded in a silicious cement, the whole being so hard that it is unworkable by any machine hitherto invented. The strength of this flagstone is remarkable: it carries from 1,711 to 2,214 tons to the square foot before being completely crushed. It is, therefore, stronger than Aberdeen granite, which fails with from 900 to 1,300 tons, York stone with 530 tons, or Northumbrian millstone grit with a little over 300 tons. The stone raised at Doonagore quarries is invaluable to builders where it is necessary to support great weights, which are concentrated on small bearings, as, for example, at the ends of girders. Templates of the very hardest and most refractory stones should always be used to distribute such loads over the largest possible areas of any underlying walls or piers, and this end may be attained by using an exceptionally

hard flagstone of sufficient thickness, without risk of failure. The labour on working these beds makes it fortunate that they may be raised from the quarries with surfaces as true as if they had all been carefully sawn and planed by machinery before being placed there; but for moulded or other dressed work of a similar character such stone is entirely unsuitable. Slabs and landings have to be squared by hand, and no better material than the stone scabbled or pitched off in doing this can be obtained for first-class walling. The face of each stone may be left "rock-faced," just as it comes off the parent block, or it may be dressed with the chisel to a fairly even surface: in any case the thickness of each course will be the same all round the building, and this without any additional expense whatever. The uniformity of such coursed walling will naturally be broken against the quoins, each of which will rise as high as three or four courses of the rubble work. The same remarks will, of course, apply to the flagstones of the Carboniferous rocks in England and Wales, the waste of which the writer has frequently used for wall facings in the manner indicated. It is not easy to understand why architects so generally neglect to use the waste of self-bedded stones for walling, especially in districts where they are common, and consequently almost valueless, for they make much handsomer and more durable work than any brick or terracotta. The neglect of this and similar material may perhaps be accounted for on the supposition that the architect is becoming, every day, more of a draughtsman than a builder; indeed, the constant failure as well as the misapplication of costly materials, seen on every hand in the City of London and elsewhere, can leave no doubt whatever on the mind of any thinking person that much of our practical architecture has fallen into the hands of amateurs, who may consider themselves artists, but who have no shadow of claim to the old title of "master builder," which comprehended that of designer, builder, and clerk of works, when our best buildings were erected. To anyone having the most elementary knowledge of the building work done in this country from the Norman Invasion down to the end of the 15th century, and its consistent gradual development, it would be simply impossible even to imagine the builders of that time erecting such absurdities here as a Grecian temple, or a Byzantine church copied from one erected at Constantinople centuries before, no matter how suitable the arrangements of the latter may have been, for displaying the sensuous and elaborate ritual of the Romish Church in the Middle Ages. As generalities leave no very definite impression on the mind, there is not much to be learned from them. So the following particular explanations will perhaps help to make the writer's views clear in this matter, and if he succeeds in doing this it will be a sufficient excuse for a rather long digression from the special subject matter of this article. An architect should have a thorough knowledge of the properties of building materials, and this knowledge he never can attain as long as he is content to deal only with lines which represent them on paper, for such lines can by no possibility suggest all the various uses and adaptations, as well as failures, which are patent enough to one who handles the actual material for himself, and not through a deputy, whether he is a surveyor or clerk of works. To enforce this, take the following examples: A large brick-fronted building erected in the City of London 30 years ago, at a cost of nearly a quarter of a million pounds, may now be seen, with the whole of the mortar pointing in an advanced state of decay. If the architect had known anything of pointing, or if he had had even the smallest amount of knowledge as to the properties of lime, cement, and sand, such an ignominious failure would have been impossible, and the work would be stronger now than when it was executed. As it is, the architect's neglect or ignorance will cost his clients several hundred pounds. At another building, which must have cost quite as much money, an expensive wrought-iron railing may be seen let into red terracotta plinth blocks, every one of which is split from end to end by the rusting iron; yet with this object lesson before him, the architect, a man in large practice, has actually duplicated this inept piece of construction within the last few weeks. Again, on the ground floors of several buildings in main thoroughfares massive granite voussoirs, strong enough to key the arches of Waterloo Bridge may be seen supporting no greater weights

than sheets of plate glass not more than $\frac{1}{2}$ in. thick. At the same time, these buildings are faultless imitations of Mediaeval or Renaissance structures erected in Germany and Italy centuries ago, and which therefore have no connection whatever with modern ideas, modern thought, or modern business necessities. No man, who was a master builder in the old sense of that name (that is, one who had a knowledge of building construction and knew how to build), could do such things, and as many such practical jokes in stone, terracotta, brick, and mortar are perpetrated by insurance companies and bankers, one cannot help wondering how they take care of other people's money when they are so prodigal with their own. To return to the Clare quarries: Messrs. Watson employ 160 men at Doonagore and Ballysara, and their steamers run between Liscannor, the shipping port in Clare, and Liverpool. This flagstone may be seen in use for templates in the new War Office buildings at Whitehall. Other quarries in these rocks are Caherbarna near Liscannor, worked by the Liscannor Quarry Co. Ltd., with 24 men; the Lough South, another quarry near Liscannor, worked by the Lough South Quarry Co., Ltd., with 78 men; Knockerra West, worked by Mr. J. B. McLachlan with 14 men; Money Point, by Bedelia O'Grady, 14 men; and Kinneliety, Moher Cliffs, 8 men. At Eonis'mon the beds of rock vary in thickness from 2 in. to 10 in., the stone is a dark grey colour, hard, compact, silicious, and consequently hard to work. The Money Point quarry, near the Shannon, turns out flagging like that raised near Carlow. The surfaces of the beds are rough, being marked with the tracks of marine worms and other animals. The latter stone was formerly cut, worked, and polished for chimney-pieces at the Killaloe Marble Works; but this trade died out about fifty years ago. Good flags are also obtained at Crag, near Kilrush. Between Kilkes and Miltown Malbay the Coal Measures are cleared, and yield true slates. They were at one time extensively worked, but there are no slate quarries in this district at present. The next formation in descending order is the Carboniferous Limestone, and it makes an extraordinary show in the north of the county. The hills of Burren are formed of bare limestone rock, which rises, terrace after terrace, to a height of 1,000 ft. above the level of the sea. The joints in this limestone are numerous and regular, each terrace floor, which is level and nearly 20 yards wide, being cut by them into large blocks of quadrangular and triangular shapes. For a distance of over 20 miles there is no trace of a fault or disturbance, or even an undulation of any kind in these beds, though their entire thickness in the district cannot be less than 1,700 ft., all good solid building stone without a parting of clay or shale. Professor Kinahan, a leading Irish geologist, divided the Carboniferous Limestone into four subordinate groups by lithological characters, which were constant locally over fairly large areas, and he was supported in this by Mr. Foot, another competent man; but Professor Jukes declined to accept the arrangement, as it was not justified by palaeontological evidence depending on time. But a lithological character is of more importance to the builder than that derived from fossil contents. Professor Kinahan's classification will be adopted here. The great mass of limestone already described constitutes such an important and distinctive assemblage of beds that it has been named "Burren Limestone," from the barony in which it occurs, and it forms the lightest division of the Irish Carboniferous Limestone in the west and south of the country. The Burren Limestone varies much in thickness. It attains its greatest development along the shore of Galway Bay; but it thins out on the south-east, towards the County of Limerick, from 1,700 to about 240 ft., the underlying "Calp" taking its place, and this in a distance of not more than thirty miles. On turning back to the quarries of the English Counties, already published in the *BUILDING NEWS*, it will be seen that towards the north the English Lower Carboniferous rocks are divided into (1) Yoredale Beds, (2) Carboniferous Limestone, and (3) Lower Limestone Shale, Millstone Grit forming passage beds into the overlying Coal Measures. In Ireland the Lower Carboniferous strata are differently divided. Kinahan finds the following series in descending order:—

- (1) Burren Limestone and Calp both together forming an upper subdivision;
- (2) Fenestella Limestone and Shaly Limestone, forming a lower subdivision;
- (3) Lower Limestone shale;

and (4) Old Red Sandstone, the basal beds of the whole. The Burren and Fenestella Limestones are frequently so hard and compact as well as being crystalline, that they yield good marbles when polished; cherty veins are found in both, these varying in thickness from 40 ft. to 100 ft.; the finest and best blocks for ornamental work are obtained from them. The whole series of Lower Carboniferous Rocks, including the basal beds, is not less than 2,750 ft. thick in North Clare; but there are few quarries, for surface blocks of good building stone are found scattered all over the county, and these are used for general building purposes. The writer built a church in Burren about 40 years ago, and the whole of the limestone used for walling and dressings was simply lifted in large square blocks from the surface of a field adjoining the churchyard, no quarrying of any kind being necessary, beyond splitting the stones with wedges to the sizes required. Large blocks were broken without much waste in the following manner: Along the top bed a line was drawn indicating the direction of the required split; about 6 in. apart on this line holes 3 in. by 1 $\frac{1}{2}$ in. by 3 in. deep were sunk with a chisel, and shallow grooves were cut down each side, continuing the line from the top to the bottom bed, when wedges were simultaneously driven into the holes with sledges, a crack was seen to run from one hole to another, and down the sides, the block having been divided into two almost as well as if it was cross-cut with a saw. If the Romans had invaded Ireland it might well be thought that Ennis Court House, built with Burren limestone, was a building designed by Vitruvius for the Emperor Augustus, and that its purpose was the worship of Jupiter Stator, or some other equally shady Roman god. Its orthodox portico and pediment, and its windowless front walls, all testify to the facts that modern architecture is a mere imitative or bedding-out process, and that architects are content to erect buildings copied wholesale from others in foreign lands, which have no conceivable connection with, and in no way satisfy, modern wants or modern requirements. It has been stated that Burren limestone is bedded, a peculiarity which makes it specially valuable to the builder. The underlying Fenestella limestone is, however, not bedded; it is massive and irregular, its characteristic colour being bluish-grey, but there are red and purple beds found in it on various horizons. Fenestella limestone is so called from the coral of which it is mainly composed. Some beds are nevertheless quite unfossiliferous and cherty, with numerous veins of calcite traversing the stone. This change, which is one of a more or less metamorphic character, is probably due to the presence of erupted igneous rocks, which are always found in close proximity to the cherty beds. The blue and coloured Fenestella cherty limestones all yield excellent marbles. They are not used at present, but at one time some quarries between Newmarket and the Shannon yielded handsome red and clouded red and grey blocks, which were worked and polished for ornamental purposes. Though there are 306 quarries, or spots where good stone may be raised, shown on the Ordnance maps of this county, there is not one limestone quarry at present scheduled as being under Government inspection. About a mile from Ennis a dark-grey semi-oolite crystalline limestone was quarried, which worked freely, but the blocks turned out were of small size. A similar stone is found at Beesley Park, the blocks being of much larger size; both have been used in building Ennis Court House and Gaol. Old Red Sandstone, or as Kinahan calls it, Lower Carboniferous Sandstone, is found in a few places only, as outliers. The colour varies from nearly white to purplish red. The stone works well, and is durable; it may be seen in the old cathedral at Killaloe. Much of the "old red" used in this county for building was, like the limestone, obtained from surface blocks which are found scattered over the hills to the south-east of Newmarket. Those quarried at Ballyheigue, and sold at 2d. per cube foot, was extensively used in the Shannon Improvement Works (1842); it stands well. A good sandstone is also found near Mount Shannon, close to the Galway County boundary, but all these sandstones are highly silicious, and wear down the tools rapidly, though the felspathic matrix in which the grains are bedded make them rather free working in the banker.

A Killaloe chimney-piece was a common item in an Irish specification 80 or 100 years ago, as "Ryegate" hearthstones and corings were in English specifications of the same period; but as

there was no Mr. Chamberlain on the warpath at that time, foreigners "dumped" their goods on our markets; and the Belgians subsequently supplied our architects and speculating builders with marble chimney-pieces at less money than they were paying for the same fixtures in sandstone and limestone, and this "ruined the home industries." Now that there is a prospect of what is facetiously called "fiscal reform," the imported article may be driven out of the country, and then builders will once more have to go to Reigate and Killaloe for their chimney-pieces, hearths, and covings. All the Silurian strata in this county, which are found in isolated exposures to the north and west of Killaloe, yield coarse roofing slates. Some of the best veins are unfortunately ruptured by faults, and consequently the workable rock is found in small pockets only—a mode of occurrence which makes it impossible to work the slates extensively and economically. In this district the Slieve Bernagh hills, and nearly all the surrounding country have at one time or other been searched for slates; quarries were found at Broadford, Knockpryse, and Craiglee, near Lough Derg; but none of these were worked for any length of time, except one at Broadford, which yielded unusually good slates, but this was also closed on account of heavy land carriage to the nearest shipping place. If a company similar to Messrs. Watson's was incorporated to work the limestones of this county, it would no doubt be financially successful, for stone is plentiful, and it comprises several beds of marble; labour is cheap, and in several districts water carriage is available for the transport of rough or worked material. To the architect in search of quaint buildings worth measuring and plotting, it may be pointed out that there is an ancient abbey at Corcomroe, on the road between Ballyvaughan and Kinvarra, which, though little known, is well worth a visit; Burren stone is used in this building, and even where it is exposed to the weather the tool marks on the dressings are as sharp and as clear as when the stones left the banker.

CORK.

The rocks in this county are Coal Measures shales and grits, Upper and Lower Carboniferous Limestones (262, 274, 296, 319, 332), with magnesian beds as deposited and altered; Lower Limestone, Shale, and Slate (344), with Coomhola grits; Old Red Sandstone (281, 298, 338); Greenstone ash and Diorite. Cork is built on Alluvium, Old Red Sandstone, and Lower Carboniferous Limestone; Cove, Lower Limestone, Shale, and Slate, Old Red Sandstone; Bandon, Lower Carboniferous Limestone; Fermoy, Old Red Sandstone, Alluvium, Lower Carboniferous Limestone; Kinsale, Lower Limestone, Shale, and Slate; Youghal, Old Red Sandstone, Lower Limestone, Shale, and Lower Limestone. The newest rocks in this county are the Coal Measures, Upper, Middle, and Lower having representatives here, the whole being about 3,500 ft. thick. They are found in the North only; the Lower and Middle divisions are absent in the South-West, the Lower only being present, its thickness being about 200 ft. Every attempt made to correlate the Irish Coal Measures with those of England have failed. The probability, however, is that they are about the same age as the Culm Measures of Devon. The Coal Measures of Cork are Metamorphic rocks, as the coals are anthracite, and the associated rocks are Grits, Shales, and Indurated Clays. The metamorphic action, whatever may have caused it, was not great, for none of the fossils in the partially-altered rocks have been obliterated. There are no workable coals in these measures. The West Cork Coal Measures are seen in Whiddy Island, Bantry Bay; near Ballinhassig, Carrigaline, and in the Oldhead of Kinsale. They generally rest on the Carboniferous Slate, the limestone being absent. The latter begins to show about Carrigaline as an earthy calcareous rock from 10 ft. to 15 ft. thick. Coal Measure Sandstones are worked here for local use only. They are generally argillaceous rocks, the basal beds being flaggy grits of not much economical value. The Lower Carboniferous rocks yield limestones, marbles, sandstones, and slates are valuable building materials. The Cork red marble is celebrated for its rich and permanent colour. Little Island red was used in Liverpool Exchange, the Museum, Oxford; St. John's College, Oxford; and other places. Fermoy red in the R.C. Cathedral, Queenstown; the R.C. Church, Thames-street, Dublin; and the Middle-

ton Grey in St. Mary Abbots, Kensington. Cork red marble was also used at St. Mary's Church and the St. Pancras Hotel for the Midland Railway Company; in fact, the best Irish red marbles are procured in this county, the principal quarries being at Boreenmanagh, Churchtown, and Little Island near Cork, Johnstown near Fermoy, and near Buttevant. Kinahan describes them as being red like jasper, streaked, variegated, and some semi-transparent. The Middleton marble is a clouded grey. In the Carboniferous Slate, near Castletown Berehaven, there are dykes of a pale yellowish Pyrophyllite, which, when polished, makes an ornamental building stone. Though Cork is a large county, there is not much Carboniferous Limestone in it. What is found there occurs in the valley of the Lee near the city, and eastwards to Youghal; it is also seen in the valley of the Blackwater. There are about 50 quarries now in work for limestone and marble, the principal being Little Island, Caherlag, Mr. D. Cantillon, 28 men; Meelin, Mr. Ryde Holland, (for Major. Aldworth), 58 men; Broomfield Middleton, Carrigtuehill, Castlemere, Crookstown; Farramastigue and Gill Abbey, Cork; Grange, Fermoy; Parknorth, Ramhill, worked by Mr. R. Colles, of the Kilkenny Marble Works; Spa Glen, Tulladuff, Liscarroll; and White Rock, Middleton. All these limestones are light grey, close-grained, compact; they work well and freely. These properties characterise the normal building stones here. In exceptional cases, as at Ramaher, near Kanturk, the rock is very fossiliferous, and difficult to work. Some beds are splintery, like those found near Mallow; but, on the whole, the Cork Limestone is second to none as for working, everlasting weather stone. Ballentemple stone was used by Burges in the miniature French church which he built in St. Finn Barrs parish, Cork, as a cathedral for the diocese; it was also used in the columns of the Court House. The lower Carboniferous rocks ("Old Red") of Cape Clear Island were used in the banks and a chapel at Skibbereen; the Clonakilty sandstone was used in the court-house there; Theval sandstone in the Martello Tower at Bantry; and Youghal sandstone in the barracks and buildings generally in that town. The Cork "Old Red" is a slaty rock of a deep purplish colour mottled with green, totally unlike the "Old Red" of Hereford and Brecon, which is compact and micaceous. The rich red sandstone used for walling in SS. Peter and Paul's Church, the R.C. cathedral, and other buildings in Cork City was quarried at Glanmire, and this stone, unlike other Old Reds, can be joint-bedded without impairing its weathering qualities. Sandstones and Grits are the principal building stones in this county, and they belong to the Lower Carboniferous or "brown stone," the yellow sandstones or Coomhola grits, known as "grey stone," or to the Silurian rocks.

THE PALACE OF MINOS.

At a meeting of the Hellenic Society, held on Tuesday at Burlington House, with Professor Butcher in the chair, Dr. Evans gave an account of his most recent excavations of the Palace of Minos, at Knossos, in Crete. The result of the last season's excavations on the site of the Minoan Palace at Knossos, he said, has been specially important from the stratigraphical point of view. Below the foundations of the latter building fresh evidence had come to light of the existence of an earlier palace, the contents of which showed connections with the Twelfth Dynasty of Egypt, and revealed a high development of civilisation by the middle of the Third Millennium before our era. Below this level, again, were structures belonging to a still earlier civilised stratum, which, in turn, overlaid 25ft. of Neolithic deposits. Besides these remote stages, a remarkable series of discoveries had now made clear the existence of an earlier stratum in the later Palace. It now appeared that below the paved floors of rooms and corridors belonging to this concluding period—itsself of considerable duration—were remains of magazines, and notably of a whole series of stone receptacles which had been definitely closed at some time of great disturbance—approximately about 1800 B.C.—and the later paved floors built over them. Several of these repositories belonging to this penultimate period contained quantities of gold-foil and remains of Cypress-wood chests that had been inlaid with plaques of crystal and faience, and which, doubtless, once contained treasure. The two most spacious and

important of these repositories were filled with relics of a sanctuary, including faience figures of a snake goddess and votaries, exquisite inlays and reliefs of the same material, tablets showing a new intermediate form of script, and clay sealings that had belonged to priestly documents now perished. It was remarkable that several of these bore religious symbols in the shape either of a plain cross or of a *crux gammata* or "Swastika." But the great surprise of the excavation was the discovery of what seemed to have been the central object of cult, in the form of a marble cross of orthodox Greek shape. Dr. Evans referred to other pre-Christian survivals of this symbol which seemed to fit on this Minoan cult. In the same way, the Minoan idea of the dove as Divioe intermediary had also showed itself very persistent. These remains belonged to what appeared to have been an extensive sanctuary in the west wing of the Palace, including the pillars incised with the double axes. A dependence of the Palace on the north-east, also recently excavated, showed a marvellously-preserved Royal villa, with flights of stairs and remains of upper stories, the principal hall of which afforded an extraordinary anticipation of the later basilica.

At a meeting of the Fellows of the British Academy, on Wednesday, Mr. Arthur Evans read a paper on "The Pictographic and Linear Scripts of Minoan Crete and their Relations."

Mr. Evans briefly traced the earlier stages in the evolution of an indigenous system of writing in Crete, as brought out by his researches from 1893 onwards. Finally, in 1900, his discovery of the clay archives in the prehistoric Palace of Knossos had supplied conclusive evidence of the existence of both a semi-pictorial and a linearised system of writing of a highly-developed kind. The relations of the two scripts, however, had remained obscure, as, owing to the circumstances in which the tablets of the pictographic class were first discovered, there was no proof that the two styles were not contemporary. The recent exploration of strata below the later floor-levels now showed that the pictographic inscriptions really belonged to an earlier Palace belonging to the "Middle Minoan period," and already displaying a high civilisation, together with indications of contact with XIIIth Dynasty Egypt (c. 2500-2200 B.C.). Mr. Evans was also able to establish various new facts with regard to this conventionalised pictographic script. The numerals, like those of the later linear script, proved to belong to the decimal system. It was also possible to trace the order of the writing in many cases. What seemed to have been a dynastic revolution destroyed the earlier Palace about the close of the third millennium B.C. In the later Palace, which came down to about 1500, a new linear system of writing was found established. In what relation did this stand to the earlier quasi-pictorial class? The most recent excavations had now produced new comparative material of the highest interest. It appeared that the later Palace itself was divided by some internal disturbance, probably involving some change of Government, into two distinct periods. Chambers and repositories were found below the later floors of this Palace which belonged to an earlier period in its history. The most important of these repositories containing relics from a sanctuary, the central cult-object of which seemed to have been a marble croc, also presented clay tablets and sealings with inscriptions in a form of linear script in several respects divergent from that of the latest Palace period. In certain respects, as in the form of the tablets, the numerals, and some characters, a greater approach to the pictographic types was visible. It did not, however, wholly represent an anterior stage of linear writing, since some signs common to this and the other class appeared in a somewhat more advanced form. It was therefore to be regarded as a parallel and alternative script superseded by the other owing to a dynastic change. It further appeared that this script answered to that of inscriptions brought to light by the Italian Mission in the small Palace or Royal villa of Hagia Triada in this and the preceding year, as well as an inscription found by the British School at Palaikastro. The two linear systems had a large element in common, and together revealed a considerable indebtedness to the earlier pictographic signary. The identity of certain sign-groups, moreover, showed that the language of the two was essentially the same. The linear tablets of the latest Palace period were much more abundant—about 1,600 having now been discovered. Besides

inventories of precious vases, ingots, chariots and horses, arms, and other possessions, the meaning of which was partly made clear by pictorial illustrations, there were other clay documents which might prove to be deeds or private records. Ink-written inscriptions on vases also existed, pointing to the former existence of writings on papyrus or other perishable materials. Very important were long lists of men and women giving what must certainly be regarded as personal names with the "man" or "woman" sign attached to each. A comparative study of these names enabled Mr. Evans to trace the existence of male and female terminations, and of hanging suffixes, as well as of compound formations of similar type to the Indo-Germanic. Both linear scripts were provided with a decimal numeration, including signs up to 10,000, and tablets dealing in percentages further showed its prevalence. Most signs seemed capable of an ideographic as well as a syllabic or possibly in cases alphabetic usage. The artificial variations in certain signs, to supply different nuances of sound or meaning, betrayed the grammarian's hand. Among the conclusions that might be deduced from the evidence of the different forms of script were: (1) Its indigenous development; (2) unity of language in Minoan Crete going back to a remote period, and probably corresponding to the Eteocretan language found later in a Greek guise at Prasos; (3) consequently an ethnography altogether different from that of the Homeric tradition, which included Achæans, Dorians, and Pelasgians, as well as the Eteocretan element; (4) clear evidence that the language was not Semitic. In conclusion, Mr. Evans pointed out the parallels existing with signs of the Cypriote Syllabary and the suggestive correspondence of many characters with the probable prototypes of Phœnician letters.

HUDSON AND KEARNS' DIARIES.

THERE is really but one alteration in these excellent diaries and blotters to note for 1904—namely, that it is once more leap year, and has to be provided with the usual extra day in February, after an unusual interregnum. Whether this is likely to be an advantage to any of us, or the reverse, is in the hands of fate, and in no way to be debited or credited to Messrs. Hudson and Kearns, who may contentedly await the repeated verdict, that no better business aids than they provide can possibly be bought by the professional man or the trader. The architect and the builder are especially indebted; for the specialties at their command embody every requisite, while neither age can spoil nor custom stale the infinite variety and completeness which combine to save the time and labour of users.

"Nobody earns
Like Hudson and Kearns
Heartiest thanks for so many good turns"

is our sincere acknowledgment, and we know it is heartily endorsed by thousands of subscribers.

AUCTIONEERS' ADJECTIVES.

A QUESTION of interest is as to how far the use of laudatory epithets can safely be carried by auctioneers, and on this point Mr. W. F. Webster, barrister-at-law, threw some light on Wednesday night in the course of a paper on "Particulars and Conditions of Sale," read before the members of the Auctioneers' Institute. Custom, it was admitted, had sanctioned a great deal of laxity. Thus it came about that the distance of a house from a railway-station was generally undertimed. A mean house, with rooms not big enough to swing a cat in, was described as "commodious," or its disadvantages veiled under the ambiguous description "convenient." The words "tasteful," "attractive," "respectable," and above all, "eligible," were worked very hard. The law allowed these trifling deviations from the truth which custom had sanctioned. The theory was that praise conferred by the vendor, and the vendor's estimate of the value of his own property, did not influence, or, at all events, ought not to influence, the purchaser's judgment, and that even if they were unfounded the purchaser had suffered no wrong, because he relied on his own opinion, or accepted the vendor's opinion at his own risk. So long as the vendor indulged in mere laudatory epithets or expressions of opinion, and avoided the use of words which amounted to a statement of fact, he was safe. It was, however, not always

easy to say whether a given statement was merely an expression of opinion or involved a statement of fact. "Substantial and convenient" was allowed to pass in the case of a house one of the external walls of which was only half a brick thick, and the walls of which had slight cracks in them. But "substantial and well-built" was considered a misstatement of fact where the buildings were seriously defective.

Mr. H. Griffin, in the course of the discussion, expressed the opinion that if the auctioneer wanted to be florid he should confine himself to the posters.

Mr. W. R. Johnson, referring to the excessive employment of adjectives, instanced a case in which a builder's villa was described as a "grand and exceptionally unique residence."

EXPANDED STEEL AND CONCRETE.

THE many important and useful applications of expanded steel in armoured concrete and plaster construction for structural and fire-resisting purposes are well known to our professional readers; and the interesting volume issued by "The New Expanded Metal Company, Ltd.," of York Mansion, York-street, Westminster, will be welcomed as a valuable epitome of the system, and as illustrating a large number of structures for which it has been employed. An interesting historical sketch of concrete construction precedes the descriptive account of the expanded metal system. The "Monier" system, invented in Paris in 1876 by Jean Monier, was one of the first systems which combined the compressive strength of concrete with steel in tension. The light steel members of this system were used in this manner, and with remarkable results; but the rods must be latticed together and wired at their intersections. The expanded metal so largely employed of late years in construction seems all that can be desired. A sheet of the "expanded metal" lying on a flat surface touches at only one point in each mesh, and the concrete gives rigidity and strength to the combination by working in and through the metal mesh, so that the latter becomes completely embedded in the concrete on the lower surface of the floor slab or beam. The meshes hold so firmly to the concrete that the steel will break before it can be pulled out; it is therefore far stronger than the rod system. A perfect bond is secured by making the metal sheets overlap one mesh. Two sections are illustrated, which show the relative strength of concrete slabs 6ft. long, one having a sheet of 3in. No. 10 expanded steel, and the other without reinforcement. The first is 3in. thick, and the latter a slab 12in. thick of concrete. Between the two thicknesses is the economic limit for the majority of cases. The expanded metal, though in mesh form, is practically a solid sheet, and, employed at the bottom of the slab, takes all the tensile stress. The tables given of tests are instructive, and show the great strength of this reinforcement. A useful report by Messrs. Fowler and Baker is reprinted, on experiments to ascertain the effect of using "expanded metal" in combination with concrete for flooring. The results of the tests are tabulated, and the summary of them shows (1) that in the case of the 3ft. 6in. span the expanded metal increases the strength of a flat concrete slab from six to eight times the strength for carrying a uniform load, and in the case of the 6ft. 6in. span the strength is increased to ten and eleven times; (2) when made with a greater proportion of cement without expanded metal, the slabs did not approach those made with it, and even with neat cement the strength was much inferior; (3) a concrete slab made with expanded metal gave higher results of strength than a concrete arch of the same span and minimum thickness at crown. Other conclusions are stated, proving the advantages of the combination, to which we must refer our readers, and the reports of tests by Messrs. Idris and Co., Ltd., and Mr. James Mansergh on slabs with and without the expanded metal are confirmatory of the general conclusions. The rest of the volume contains papers by Mr. A. T. Walmisley, M.I.C.E., on the use of expanded metal, mathematically heated, directions for its use, the channel arch floor showing several applications for floors of warehouses, factories, &c. The volume is handsomely got up and illustrated, and should find its place in the office library of every architect and engineer.

The American Lorain Steel Co. has secured the contract for the Wolverhampton electric tramways.

OBITUARY.

MR. JAMES HIBBERT, formerly an architect having an extensive practice at Preston, and a leading member of the town council of that borough, died on the 19th inst., at his residence, Ashby Folville, Anerley, S.E., in his 71st year. Mr. Hibbert's chief work was the Harris Free Library and Museum at Preston, a large Classic edifice erected in 1885-6, of which he was not only the architect, but the deviser of the scheme. He was for years an Alderman of Preston, and served as Mayor. The interment took place at Preston.

CHIPS.

At the last meeting of the Sunderland Corporation, the markets and baths committee reported that, as instructed by the council, they had further considered the question of the erection of new baths and washhouses in Hendon-road, and they recommended that the buildings be erected by workmen employed by the council under the superintendence of the borough surveyor, at an estimated cost of £9,500. The recommendation was adopted after a long discussion.

The Littlehampton Urban District Council have accepted Mr. Carnegie's offer of £2,500 for a free library. The council's surveyor, Mr. H. Howard, has been instructed to prepare designs for the carrying-out of this work.

The Report of the Metropolitan Wesleyan Chapel Committee states that five new buildings are in actual progress, involving an estimated expenditure of £160,000. Five other churches are about to be commenced, that at Upper Tooting costing £16,000. Two large mission-halls are to be built, that at Stepney costing £16,000; also one at Plumstead, at an outlay of £14,000. Other new Wesleyan churches are to follow almost immediately at Highgate, Acton, Lower Sydenham, and Sutton.

The borough surveyor of Blackpool, Mr. Brodie, reports that the section of the widened promenade from South Shore has cost so far £42,096, and the Central Pier portion £12,326.

Large premises between Ferndale-road and the Chatham and Brighton Railway Companies' lines at Brixton, which proved a financial failure as a polytechnic and as public baths, have been acquired by the London County Council, who have practically rebuilt them, and will open them as a technical institute in January next.

The proposal of the Salford Corporation to build workmen's dwellings on land in Seaford-road, Pendleton, was the subject of a Local Government Board inquiry held in the town-hall, Salford, by Major C. E. Norton. The application of the corporation was for sanction to borrow £47,737 under the Housing of the Working Classes Act, 1890, for the purchase of the site and the erection of houses. The plans were shown and explained by Mr. Corbett, the borough engineer. There was some opposition to the scheme on the ground that the houses proposed to be built would be of a better class than could be paid for by the people who are compelled to seek new homes through the demolition of inferior property.

A new pavilion for fever cases, which has been erected at the Brighton Sanatorium by the corporation, was opened the other day by the mayor of Brighton. Mr. Francis J. C. May, borough surveyor, is the architect of the building.

The town council of Shrewsbury have raised the salary of Mr. Johnston, their electrical engineer, from £300 to £350 a year.

The opening ceremony in connection with the new Wesleyan Sunday-school which has been erected at Halebank, Liverpool, took place last week. The new schools, which have a front of Ruabon brick and terracotta ornamentation, provide accommodation for 200 scholars, and are furnished in pitchpine. The cost has been £970.

In the application for discharge from bankruptcy on behalf of David Osborn, builder and contractor, Berkhamsted, Hertfordshire, the order of discharge has been suspended for two years ending Oct. 14, 1905.

A stained-glass window, subscribed for by the past and present nurses of the Staffordshire Institution for Nurses to the memory of the late Miss Mary Shirley, has been erected in St. Barnabas Church, Stoke-on-Trent. The subject is Mary seated at the feet of Jesus.

The restoration of the chancel of Northorpe Church, near Gainsborough, is complete, and two new stained-glass windows have been put in. The subject of the east window is the Transfiguration, and in the south window the figures are shown of St. Andrew, St. Mary the blessed Virgin, and St. Elizabeth. There have also been added a new oak altar and choir stalls, which have been given by the Ecclesiastical Commissioners, and are the works of Messrs. Bowman and Sons, of Stamford.

Building Intelligence.

AXBRIDGE.—A new workhouse infirmary has been opened by the Right Hon. Walter Long, M.P., the President of the Local Government Board. Mr. A. Powell, engineer to the guardians, prepared the plans, and the builder was Mr. Charles Addicott, of Weston-super-Mare, whose tender was accepted at the sum of £5,340. The infirmary is of two stories, constructed of mountain limestone, with Bath stone dressings, and tiled with Bridgwater interlocking tiles. The building is in two distinct parts, the east side for the men and the west for the women, and consists of bed accommodation for 72 people. On the ground floor are two main wards having twelve beds each, and being 36ft. long and 24ft. wide, with lavatory accommodation adjoining, and there are also four separation wards with separate lavatory accommodation, and also two smaller separation wards, and the nurses' kitchen. Day-room accommodation is provided in two rooms facing the south, with bay windows, and there are two bath-rooms. The first floor is similar to the ground floor, with the exception that on the women's side the two separation wards will be utilised as lying-in wards. Hot-water pipes and coils are laid on throughout the whole of the building. Verandahs have been constructed 7ft. wide on the south side of the building. The whole of the building is lit by electric light. The total cost of land, construction of building, heating, lighting, and other contingent expenses comes to a little under £100 per bed.

BECKENHAM, KENT.—The Archbishop of Canterbury visited Beckenham on Saturday, and dedicated the new tower of the parish church, a peal of bells, and a clock. The tower has been designed to harmonise with the main building, in the style of the Late Decorated period. It is built of Kentish rag and stone. The church itself, begun in 1885, accommodates nearly 1,100 worshippers, and has cost altogether over £28,000. The old church, existing until 1884, seated less than 400 persons, and was described as the "smallest and most inconvenient in the parish." Six of the original bells have been recast, and two others added are, with the clock, the gift of Mr. C. E. Atkinson. Two stained glass windows, the work of Messrs. Heaton, Butler, and Bayne, of Garrick-street, W.C., have been placed in the west porch. The contractors for the new tower are Messrs. William G. Bartleet and Sons, of New Broad-street, E.C.

BIRMINGHAM.—The Education Committee of the City Council have received tenders for the erection of a new school in Oldknow-road, Victoria Park, in accordance with the plans approved by the late School Board and Board of Education. The building has been planned on the ground-floor system, with three separate departments for boys, girls, and infants, the classrooms, to accommodate fifty children in each, being ranged round each of the large central halls. The central halls will be used for drill and assembling purposes only, and are not counted in the accommodation. The total accommodation of the school is for 1,070 children—viz., 350 boys, 350 girls, and 370 infants. A caretaker's house is included, and also a manual instruction centre which will serve the requirements of a number of schools in the district. The committee have accepted the tender of Mr. John Webb, amounting to £18,799, for the erection of the buildings.

DEPTFORD, S.E.—Carrington House, on the Mill-lane area, Deptford, was opened by the Countess Carrington on Saturday afternoon. It replaces some slum property acquired by the London County Council, and is six stories in height, with red brick with Portland stone dressings. It contains 814 cubicles, with accommodation for 302 lodgers and 12 porters. Adjoining are Sylva Cottages, also built for the London County Council, and housing 144 persons. The scheme for the improvement of the Mill-lane area was prepared by Mr. W. A. Blaxland, the Council's solicitor, and the acquisition of the property was carried out by the Council's valuer, Mr. Andrew Young. Mr. W. E. Riley, F.R.I.B.A., the Council's superintending architect, prepared the whole of the plans of Carrington House and of Sylva Cottages, and the buildings have been erected under his supervision. The principal part of the furniture has also been designed under his direction. Throughout the preparation of the plans of Carrington House the

Council had the advantage of the advice and assistance of the late Lord Rowton. The works in connection with the widening of Mill-lane were carried out, under the supervision of Sir Alexander Binnie, at that time the Council's engineer, by the then manager of works, Mr. W. Adams. The lodging-house has been erected by the Council's present manager of works, Mr. G. W. Humphreys, and the contract for building *Sylva Jottsages* was taken by Mr. H. L. Holloway, at £4,767. The gross outlay on the clearance has been £22,806, and the net cost to the ratepayers will be £8,631. The electrical work has been carried out under the direction of Mr. M. Fitzmaurice, C.M.G., the Council's engineer.

FISHPONDS, BRISTOL.—The foundation-stone of the new wing of the Diocesan Training College, Fishponds, was laid on Thursday in last week by the Bishop of Bristol. The annexe will form a south wing to the college, with a length of 125ft., and a width of 45ft., connected with the main building by a covered cloister 52ft. long. It will consist of two lecture rooms, 37ft. by 27ft., two sitting-rooms, and dormitories to accommodate twenty-six students, and two governesses' rooms. The design throughout will be in strict keeping with the Gothic style carried out in the already existing college buildings, which were erected in 1854 at a cost of £12,000. The estimated cost of the wing is £4,340, exclusive of furnishing. The work is being carried out by Mr. C. A. Hayes, building contractor, Thomas-street, Bristol, from designs supplied by Mr. W. V. Gough, architect, also of Bristol.

GREAT YARMOUTH.—On Wednesday week the new chimney of Yarmouth Corporation electric works had a christening ceremony. The mayor and a number of members of the corporation assembled at the chimney, and were entertained to champagne by the contractors, Messrs. Carter and Wright. The municipal visitors were hoisted by a lift which has been used during the construction of the chimney to the top. The chimney was erected under contract with the corporation, from plans prepared by the borough surveyor. The foundations were taken down 7ft. below the ground. There a bed of concrete, 40ft. square and 6ft. in depth, was put in at one time by relays of men following each other, which involved handling 500 tons of material, being completed in forty-eight hours. The chimney is 175ft. in height, and its weight above ground 2,400 tons. The internal size at the apex is 9½ft. square, and at the base 23ft. Its duty will ultimately be to provide draught for boilers of 3,000H.P. The destructor chimney at Yarmouth, it may be mentioned for purposes of comparison, is 200ft. in height, but has an internal diameter at its summit of over 6ft. The new shaft is built square, of red brick, and from 6ft. in thickness at the base the sides taper off. The work has been carried out under the supervision of the borough surveyor, and the assistant on his staff responsible for the construction was Mr. Leeper.

IPSWICH.—The new electricity generating station in Constantine-road, Ipswich, was formally opened by the mayoress on Saturday, and at the same time the tramways, which have been acquired by the corporation from a private company, converted from horse to electric traction, and greatly extended, were inaugurated. The urgently-needed street improvements, carried out simultaneously with these works, have cost the borough £80,000. Mr. C. Stanley Peach, F.R.I.B.A., of London, was the architect, and the consulting electrical engineer has been Dr. Alexander W. B. Kennedy. The contractors for the tramways and equipment were the British Westinghouse Company and Messrs. Dick, Kerr, and Co., the latter being represented by Mr. Macintosh as resident engineer. The generating station, work-shop, car-shed, and offices have been built by Mr. S. A. Kenney, of Ipswich, the amount of his contract being £26,948 for the generating station and offices, and £6,704 for car-shed. The buildings include an engine-room, with a 10ft. basement. Attached to it are battery-room, boiler-house, workshop, economiser building, and car-shed. The offices are on the ground floor. On the first floor is the switch-board gallery, engineering charge office, work-shop, motor-room, drawing-office, &c. Mr. Cecil C. King was the resident architect, and Mr. James Yarrow has acted as clerk of the works on behalf of the corporation. The refuse destructor, which is also located on the site, cost £3,695. The other expenses, including half the

cost of the chimney shaft, brought the total to £12,000. The destructor has been put in, and the destructor buildings and the shaft have been erected by Mr. Shillitoe, of Bury St. Edmunds, whose contract price was £5,500. The shaft at the bottom outside is 21ft. 6in. across, and the walls are 3ft. thick. It is 178½ft. high, and is 12ft. square inside at the top. The destructor buildings are of brick and corrugated iron.

LEEDS.—The new dispensary in North-street is rapidly nearing completion, only the fittings requiring now to be fixed. The architects are Messrs. Bedford and Kitson, of Leeds. The plainness of the building's exterior has been relieved by a cartouche consisting of two figures of cherubs, placed over the principal entrance in North-street, and a seated figure representing Charity over the doorway leading to the out-patients' department in Hartley Mill. These figures have been executed by Mr. H. C. Fehr. The site, which covers over a quarter of an acre, has been purchased at a cost of £10,000, and the building will cost another £18,000. Small Accrington brick has been used in the facings, with dressings of Portland stone. The residential part faces North-street, and occupies the first and second floors, with kitchens and servants' rooms above, while the ground-floor of the North-street front is occupied by the board-room, secretary's office, &c. Behind this is an out-patients' waiting-hall, 90ft. by 30ft. On either side of this are the surgical, medical, and ophthalmic consulting and examination rooms. Provision has been made on the floor above for the chemical laboratory and for a dental department.

LONDON COUNTY COUNCIL.—At the weekly meeting of this body on Tuesday, a discussion arose on a recommendation of the Highways Committee that the erection of the superstructure of the car-sheds for the New-cross and Greenwich trams should be executed by the Works Department without the intervention of a contractor. The architect's estimate of the cost, including £3,500 for clerk of works salary and architectural and other expenses, was £84,030. The recommendation was eventually adopted, a motion in favour of advertising for tenders being defeated. On the recommendation of the Housing of the Working Classes Committee the tender of Messrs. Kirk and Randall, of Woolwich, for £17,884 was accepted for the erection of Valette-buildings, Jerusalem-square, Hackney. These buildings are required for the accommodation of persons of the working classes displaced by the Mare-street, Hackney, improvement. The architect's estimate for this work was £18,978. The building will consist of one block of five-story dwellings, and will provide accommodation for 416 persons, in 39 tenements of two rooms, 34 tenements of three rooms, and seven tenements of four rooms.

NEWCASTLE-ON-TYNE.—A report on the proposed extensions (with nurses' home) at the City Hospital for Infectious Diseases, Walker Gate, has been issued by Mr. F. H. Holford, city property surveyor, to members of the Newcastle City Council. The accommodation required, and for which plans have been prepared, includes two new pavilions, containing two wards, with ten beds in each, six private wards of one bed each, also additions to the present isolation block, with two new double-bedded wards, and the two present nurses' duty rooms are to be converted into wards. It is further proposed to convert present nurses' duty rooms in four pavilions into wards of one bed each. The total additional number of beds in the pavilions, isolation block, receiving rooms, &c., will be 74. It is also proposed to erect a nurses' home to the north of the hospital. The estimated cost of the whole of the projected works is £33,528. With regard to the smallpox hospital on the Town Moor, the additions and alterations to the old building are practically completed. The cost of the work has been £3,846 13s. 2d.

ROTTERHAM.—The new Wesleyan church in Talbot-lane was recently opened. It replaces a chapel, Classic in character, destroyed by fire on November 15, 1901. The style of the new church is Decorated Gothic, and the tower and spire rise to a height of 130ft. There is also a smaller tower at the rear of the building. The church itself consists of nave, transepts, and chancel, and will accommodate 860 worshippers, 500 being on the ground floor and 360 in the gallery, which runs round three sides of the building. There are vestries for the minister and the choir on the ground floor, and a chamber is provided for the organ. Full advantage has been taken of the

sloping nature of the ground, and a church parLOUR, 36ft. by 22ft., has been arranged below the chancel, and on this level also are the kitchen, two classrooms, and a storeroom. The tracery windows throughout are filled with tinted leaded lights, carried out by Mr. T. W. Camm, of Smethwick, Birmingham, and the three chancel windows are filled with stained glass by Mr. S. Evans, of Birmingham. The heating is by low-pressure hot-water apparatus supplied by Wright Bros., Sheffield. The whole building is faced with stone. The contract has been carried out by Mr. Robert Snell, of Masbro', from the designs and under the supervision of Messrs. W. J. Morley, F.R.I.B.A., and Son, architects, Bradford, the whole cost being £10,000, exclusive of organ.

SOUTHAMPTON.—The Bishop of Winchester has consecrated the new church of St. Barnabas, Lodge-road. The church, which is of dressed stone, and replaces an iron building, is of Gothic design, and has been erected at a total cost, including fittings, furnishing fees, fencing, and all expenses, of £7,100. The seating of oak pews provides accommodation for 624 persons, and 150 chairs can be utilised as occasion requires. Messrs. Mitchell, Son, and Gutteridge, of Southampton, were the architects, and Messrs. Jenkins and Sons, of the same town, the builders.

STOCKWELL, S.E.—The Bishop of Rochester laid, on Tuesday, the foundation-stone of the first of a number of residential clubs for young business men which it is intended to establish in different parts of London under the name of "Ingram Houses." The building is to be at Stockwell, where a site has been acquired at a cost of £10,826. The Stockwell-road house will include four floors of bedrooms, a suite of club-rooms on the ground floor, and a large basement containing other club-rooms, as well as the service of the building. Accommodation will be provided for 208 residents, each of whom will have a separate room, not less than 7ft. by 10ft., and the use of the club-rooms in common. The rent, which will also include service, will range from 7s. to 12s. a week per bedroom. The club-rooms on the ground floor include a dining-hall, a smoking-room, a library, and a billiard-room for three tables. There are to be, in addition, in the basement a lecture-hall, to be fitted as a gymnasium, and a second billiard-room, also containing three tables. The estimated cost of the building, including furnishing, is £36,000, and it is hoped that the work will be completed in May, 1905. Mr. Arthur T. Bolton, of Victoria Mansions, Westminster, architect to the company, has designed the house, and the contractors are Messrs. Rudd and Son, of Grantham.

SHREWSBURY.—The headquarters of the Shropshire Constabulary have now been removed from the Square to new buildings on Swan-hill, also in Shrewsbury. Built of Ruabon bricks, with Grinshill stone dressings, the premises are fitted with wrought-iron window frames. On the ground floor are an occasional court and the orderly clerk's room, with observation windows into the main hall. On the other side of the hall is a charge and parade room, and beyond this a corridor leading to the cells, which are lined with white glazed bricks. The staircase, with substantial oak railings, leads to the chief constable's office, the office of the chief clerk, and the pay clerk's office, stationery storeroom, and to a constables' room. At the rear is a superintendent's house. In the parade yard at the back are a motor and cycle house and stabling. Fire hydrants have been placed in different parts, while the artificial lighting is supplied by electricity. The work has been carried out by Mr. T. Pace, Shrewsbury, to the plans of the county surveyor, Mr. A. T. Davis, M.I.C.E. The expenditure has been £6,000.

TOYNTON.—The church of Toynton All Saints, in the deanery of Bolingbroke, Lincs, which is now under repair and restoration, has been found to contain a Late 13th-century arcade in the south wall and a Norman arcade in the north wall. These were not discovered till the plaster was removed. The north arcade, which is much damaged by fire, is in a weak state, and needs underpinning; but the bishop, the rural dean, and the rector are of opinion that it would be a great pity that the arcades should be built up again for lack of funds. To display them will add £250 to the cost of restoration. The architect is Mr. Harold Bailey, of Newark-on-Trent. It may be added that the south arcade consists of four bays. There are two limestone pillars,

octagonal in shape, but standing on square bases. Three of the arches are perfect, but one has at some time been cut away to make room for a window to give light to the west gallery. The Norman arcade has five bays of about 9ft. each. The pillars are round, with carved capitals. The two arches which have so far been cleared show traces of the Norman custom of coating sandstone with plaster and then painting the plaster. When the arches were built up in the 14th or 15th century the brickwork was plastered and the plaster adorned with ornamental lettering.

WAKEFIELD CATHEDRAL.—A meeting of the joint committees of the Walsham How Memorial Fund for the enlargement of the Wakefield Cathedral was recently held at Wakefield. The Bishop of Wakefield presided. Sub-committees were appointed to deal with the heating and lighting of the edifice, and the engineer gave particulars of the scheme and exhibited plans. Drawings of the base of the tomb were shown to the meeting, and were referred to the sub-committees for consideration. The bi-hop and the archdeacon reported as to the altar-screen, and stated that Colonel Clapham, of Manchester, had consented to provide new wings to the reredos. The clerk of the works gave his report, which showed that the work of the extensions was progressing very satisfactorily.

CHIPS.

Dr. Tristram, K.C., the Chancellor for the diocese of London, has granted a faculty to the vicar and churchwardens of St. Columba's, Haggerston, first for making a new and more convenient entrance to the parish church, and, secondly, for erecting a mortuary chapel in a cloister to be constructed by the side of the church.

Mr. W. O. E. Meade King, a Local Government Board inspector, has held an inquiry at Redruth, respecting the application of the urban district council to borrow £6,750 for work of sewerage and sewage disposal, including works to be erected beyond the limits of the districts—viz., in the parish of Illogan and land within the jurisdiction of Redruth Rural Council. The scheme includes the conveyance of drainages through pipes from Redruth's present outfall to Portreath, and the carrying it out to sea by tunnelling through the cliff.

The fish market at Aberdeen, the largest in Scotland, has been further extended by the addition of a covered floor space 600ft. in length and 50ft. in width, and a 10ft. wide wharf along its entire length. The old platform showed a depth of only 8ft. at low water, but the new wharf indicates 15ft. at ebb tide. The total cost of the wharf and works is about £15,000.

The Local Government Board have intimated their willingness to consent to the application for £13,000 to be borrowed from the Board of Works by the Strabane Urban District Council for the erection of new gasworks. Mr. Charles Hunt, of Westminster, is the engineer.

The Corporation of Wolverhampton have issued notice of their intention in the ensuing session to apply to Parliament for an Act to enable them to do a variety of things. They intend to ask for powers to construct tramways into Heath Town and Wednesfield; reconstruct, widen, and improve a bridge over the canal at Wednesfield; erect new buildings, supply electricity, and deal with markets, streets, sewers, drains, sanitary provisions, common lodging-houses, and the borrowing of money.

A memorial window of stained glass, executed by Mr. S. Caldwell, of Canterbury, has been placed in the chapel of Walsingham Workhouse. It is placed in the east end of the chapel. The centre light represents the ascension of our Lord, whilst on either side the subjects are Christ blessing little children, and the anointing of Christ by Mary.

The Preston Town Council have decided to promote a Bill in Parliament to enable the Corporation to undertake extensions of the existing waterworks, which it is estimated will cost between £150,000 and £200,000, and which will meet the needs of the town for the next twenty years.

A Hammersmith bootmaker, who claimed £1,654 from the London United Tramways Company for damage suffered by him in his business through the forcible acquisition of the forecourt of his shop, has been awarded £557 in the Sheriff's Court.

The partnership hitherto existing between II. Spurrell and W. H. Murray, architects and surveyors, Eastbourne, under the style of Spurrell and Murray, has been dissolved.

A Bill has been introduced into the Legislative Council of the Viceroy of India by Sir Denzil Ibbetson for the purpose of giving Government powers for the preservation of privately-owned ancient monuments.

LEGAL INTELLIGENCE.

IN RE LIGHTBOUND, RIGBY, and Co.—At the Liverpool Bankruptcy Court on Friday, Charles Latham and Ralph Norbury, who had traded as timber merchants, under the style of Lightbound, Rigby, and Co., appeared for public examination. The joint statement of affairs shows liabilities expected to rank of £78,761, and assets of £80,143, giving an apparent surplus. The bulk of the assets, however, are locked up in a building scheme at Oak-hill Park, the realisation of which has yet to be undertaken. Replying to the Official Receiver, Mr. Latham related the history of his firm. It began in 1888, to some extent on borrowed capital. In March, 1893, a statement prepared showed the profits for the five years had been £4,388. In June, 1900, another statement showed that for those seven years the profits were £16,174; but the joint drawings of the partners in that period were more than double. The bankrupt admitted having lived beyond his means. The position of the firm was largely ascribed to the building scheme. Accommodation bill transactions were admitted to have extended over three or four years. An adjournment to December 3 was taken.

IN RE W. H. WATERMAN, ARCHITECT.—The receiving order in this case was made upon a creditor's petition, the debtor, William Henry Waterman, being described as of 7, Cullum-street, E.C. The statutory meeting was held last week before Mr. Walter Boyle, Assistant Receiver. It appeared from the debtor's statements that he had previously failed in 1894, but the receiving order was rescinded on the payment of a composition. Shortly after the failure he started business as an architect, at 7, Cullum-street, with a borrowed capital of £250, which he had since repaid. For some time he carried on the business in partnership with another person, but a dissolution was arrived at in 1899. About a year later another person, who introduced a capital of £1,500, joined the debtor in partnership, and they had since carried on the business. The debtor attributed his failure to costs of litigation, to bad debts, and to other causes. He stated that his insolvency was also partly due to loss on the sale of horses, which he had bought and sold more for a hobby than for a business. The chairman reported that a rough statement of affairs had been lodged showing liabilities £4,689 5s. 5d., of which £3,049 15s. 5d. was unsecured; and assets valued at £1,392. Mr. W. Morley attended the meeting on the debtor's behalf, but submitted no proposal. A resolution for bankruptcy was accordingly passed, and an accountant was nominated as the trustee to wind up the estate. The public examination is fixed for December 15.

A MILLBANK ARBITRATION: REINSTATEMENT AS A BASIS OF COMPENSATION.—Mr. John Troutbeck, High Bailiff for Westminster, and a special jury, heard, on Thursday, Friday, and Monday, the case in which Messrs. Vacher and Sons, Parliamentary printers, of Great Smith-street, Westminster, claimed from the London County Council £25,600 as compensation for the compulsory acquisition of their leasehold interest in the premises, 20 and 22, Millbank-street, Westminster, required by the Council in connection with the improvement of that thoroughfare. The claimants' case was based on the principle of reinstatement, they having erected large premises in Great Smith-street at a cost of £27,000, incurring an extra rental, over and above the £500 paid for the old premises, of £1,619 per annum. On this sum they claimed ten years' purchase, and the other items included: Value of machinery, £3,849; two years' net profits, £4,700; and removal of stock, £500. Expert evidence in support of these figures was given by Mr. Tewson, Mr. Trollope, and Mr. John Eason. Sir Edward Clarke described the claim as an extravagant one, and said the County Council refused to recognise it on the basis of reinstatement. For the County Council, Mr. Samuel Walker stated that the utmost the claimants were entitled to was £4,364. He could have housed them in a nearer and more suitable building for £5,000. Mr. Howard Martin, another surveyor, said he thought £4,043 would amply compensate the claimants. The High Bailiff said that unless the jury thought the ordinary mode of compensation would do the claimants an injustice, they ought not, in his opinion, to adopt the basis of reinstatement. It was a very serious and important case, as the adoption of the principle of reinstatement might create a prohibitive cost of carrying out public improvements. The jury awarded the claimants £8,413.

CLAIM BY AN ARCHITECT.—At the Binger County-court last week, before Sir Horatio Lloyd, Mr. R. G. Thomas, architect and surveyor, Menai Bridge, brought an action against Mr. J. Harold Hope, of Penmon Park Quarries, Anglesey, to recover £34 13s. for professional services rendered in viewing land at the quarries, preparing plans and tracings of a house and office at Penmon, examining plans and quantities, and assisting the quarry manager in pricing for a contract for the Grand Hotel, Llandudno, and the same with the sea wall and promenade at Penmaenmawr. Mr. Ellis J.

Griffith, M.P., appeared for the plaintiff, Mr. J. Bryn Roberts, M.P., being for the defendant. The case had been transferred from the High Court. The defendant had paid £15 into court, contending that that was sufficient to meet the work done. After hearing the evidence, his Honour gave judgment for plaintiff for 20 guineas and costs.

IN RE G. R. H. WALES.—An adjourned sitting has been held for the public examination of G. R. H. Wales, builder, of Cassland-road, South Hackney, N.E. The statement of affairs showed gross liabilities amounting to £33,762 5s. 11d., ranking liabilities £5,372 8s., and an estimated surplus of assets. The debtor had been engaged in building operations at Acton, Hackney, Harlesden, Obiswick, Shepherd's Bush, and Willesden, and attributed his bankruptcy to pressure by creditors and inability to realise certain property at Acton. The examination was concluded.

IN RE H. J. CAVE.—A sitting was held last week for the public examination of Mr. Harry Jarvis Cave, builder, of Lauderdale Mansions, Lauderdale-road, Maida Vale, W. The gross liabilities were returned at £126,831 15s. 10d., of which £8,684 15s. 13d. was unsecured, and the assets were estimated by the debtor to produce £34,760 19s., consisting almost entirely of an estimated surplus expected to be realised from securities held by creditors treated as fully secured. It appeared from the debtor's statement that he began business as a speculative builder ten years ago, when he was twenty-one years of age, and had very little capital. He had since been engaged in the erection of buildings at Clapham, Willesden-lane, Haverstock Hill, and Maida Vale. His failure was partly due to his inability to let many of the flats which he built in Lauderdale-road, Maida Vale; also to the payment of heavy interest, and inability to obtain adequate loans on permanent mortgages of his properties. His statement of affairs showed an estimated surplus of £25,000, but he did not think so large a surplus would be realised. During the past three years his expenditure had amounted to £9,471 18s. 2d. The examination was concluded.

IN RE JOHN NELSON, OF YORK.—John Nelson, of York, who formerly carried on business on a large scale as a contractor and brickmaker in that city, recently applied to Judge Topley, sitting at the York County-court, for discharge from bankruptcy. The Official Receiver reported that the receiving order was made in December, 1901. Bankrupt's estimate of liabilities to rank for dividend was £10,123, but the proofs actually admitted amounted to £12,619. The unassigned assets were estimated to produce £13,935, but had only realised £2,614, this difference being accounted for mainly by the forfeiture to the North-Eastern Railway Company of the retention money due under the contract, the price of work done, and the plant on the works, in pursuance of the terms of agreement entered into with the bankrupt. A first and final dividend of 3s. in the pound was paid on proofs for £12,619. The cause of bankruptcy was the disastrous result of the contract entered into by the debtor with the North-Eastern Railway Company for the making and deviation of a railway at Dunston, near Newcastle-on-Tyne, for £32,000. Soon after the work was begun it was found, owing to the nature of the subsoil, to be almost impossible to get a solid foundation. All the debtor's capital seemed to have been expended in the work, as well as £18,000 received on account from the company. It was alleged that the person who took the job, immediately following Mr. Nelson, died as a result of it, and the thing is still unfinished. The discharge was granted, subject to suspension for two years.

A LEITH ARBITRATION.—Mr. Charles J. Guthrie, K.C., as the oversman in the reference between the trustees of the late Mr. John M'Farlane, of Bundermere, and the Caledonian Railway Company as to the value of the property belonging to Mr. M'Farlane in Leith Walk, has now issued his proposed findings. The company took the ground for the purposes of their new railway. Having inspected the ground acquired and taken evidence of the averments of parties and heard them thereon, the oversman finds that the value of the subjects to the claimants as at the date of the company's notice to treat was £1,531, and that the claimants are entitled to this sum, with 10 per cent. added, making £1,684 2s., with interest at 5 per cent. from May 15, 1903. At the hearing the claimants claimed an award of £6,500, while the company maintained that the award should be about £1,000, exclusive of the usual 10 per cent. for compulsory purchase. Mr. Jameson, K.C., was nominated as arbiter by the claimants, while the company nominated Mr. James Watt, W.S.

The Worshipful Company of Plumbers give notice that they will, upon application, register the names of apprentices free of cost. Apprentices who pass the final examination are eligible to receive the Certificate of Registration under the National Registration of Plumbers.

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ILLUSTRATIONS.

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BRONZE MEDAL DESIGNS FOR BOOK ILLUSTRATIONS.—
CONGREGATIONAL CHURCH AND SCHOOL, JARVIS BROOK,
SUSSEX.—BANK OF NEW SOUTH WALES, INVERCARGILL,
NEW ZEALAND.—SEACROFT GOLF LINKS HOTEL, SKZGNESS.
—GROUP OF JACOBAN FURNITURE.—ANTIQUE OAK CEILING
AND FLOOR.

Our Illustrations.

HEYWOOD FREE LIBRARY.

This design, by Messrs. North and Robin, of 203, Strand, London, was placed first in the recent open competition, Mr. Duncan (of Messrs. Butterworth and Duncan) being the assessor. It is proposed that the main front be executed in stone and the flanks in stone and brick, the roofs being covered with green Westmoreland slates.

DISTRICT OFFICES, HAMILTON.

This illustration shows the committee-room included in the suite of offices for the Middle Ward District of the County of Lanark, the staircase and central hall of which were published on Sept. 25 last. The architect is Mr. Alex. Cullen, Brandon Chambers, Hamilton.

NATIONAL BRONZE MEDAL DESIGN FOR BOOK ILLUSTRATION.

This composition is simply a decorative treatment of landscape combined with an architectural ideal in strong line work, drawn with a view to reproduction and reduced scale. Otherwise it explains itself. The author is Mr. Edward R. Clarke, of Scarborough, who was awarded a bronze medal this year, the judges remarking upon his "vivid impressions from nature, which are united with a bold and effective convention which make his work highly decorative."

CHAPEL AND SCHOOLS, JARVIS BROOK, SUSSEX.

This building is proposed to be built of stone from the local quarries, with oak half-timbering, roof covered with tiles, and tower roof with oak shingles. The accommodation of the church on the ground floor is for 266, and for 55 in the small gallery at north end. The school comprises large hall and classrooms, with kitchen, &c., and, in addition, are planned as schools for Sunday, and lecture-hall and recreation rooms on work-days. The estimated cost is £3,500. The promoters of the scheme are desirous that the building should express what it is intended for—viz., a country church and school. The architect is Mr. Wm. C. F. Gillam, M.S.A., of Brighton.

BANK OF NEW SOUTH WALES, INVERCARGILL, NEW ZEALAND.

The bank premises on the ground floor comprise a banking chamber, 25ft. high, manager's room, strong room; telephone, typewriting, and stationery rooms, and a sitting-room and bedroom for a resident clerk. The remainder of the ground floor is occupied by a shop with office attached, and separate ranges of latrines for the use of the bank staff and the offices are placed in the corner of the site. On the upper floors, which are approached by wide staircases from both streets, are 26 suites of offices for letting, with seven strong rooms, lavatories, &c. Internally

the walls are all plastered, and have dadoes of native red pine with machine-carved mouldings. The ceilings are of stamped steel, those in the principal rooms of elaborate design. That of banking-chamber is deeply coved and richly ornamented. Native figured red pine is used for the banking chamber fittings enriched with carving and dull polished. Externally the walls, which are of brick, are finished with cement plaster, except the plinth, which is of local ocean beach granite. The steps are of white Sicilian marble, and the porches are paved with encaustic tiles. The cost complete is about £7,000. Mr. C. J. Brodrick is the architect.

SEACROFT GOLF LINKS HOTEL.

The Seacroft Golf Links Hotel is proposed to be a red brick building up to the first-floor level, above which it will be roughcast, and with a "modelled" wood cornice, which will be painted white, the roof being covered with hand-made strawberry-coloured tiles. The accommodation provides not only the ordinary hotel accommodation, but also a small golf club, with the necessary dressing-rooms, &c. Messrs. Brewill and Baily, F.F.R.I.B.A., Nottingham, are the architects.

GROUP OF JACOBAN FURNITURE.

Good old solid furniture of this type is always interesting, although in such traditional cabinet-work the ever-varying details of its design do not appear at once so evident as they often really are, and thus the casual observer of such things is under the impression that he has seen all that he need know about them. Neither of the pieces sketched to-day show any leading variation of form from the usual type to which they belong, and yet at the same time each displays those minor differences which are characteristic of work done individually by craftsmen who worked with personal interests in what they were producing, and not with unvarying imitation of some set pattern at so much per thousand, as men labour now.

FINE ANTIQUE SOLID OAK CEILING AND FLOOR, TAUNTON.

This admirably designed oak ceiling of the time of Charles II. is drawn in detail by Mr. C. H. Samson, of the firm of Messrs. Samson and Cottam, architects, of Taunton. The work requires but little description, as it is so clearly shown. The main beams, which run transversely, carry the weight of the whole structure, the intersecting longitudinal ones of the same scantling merely being framed into the end wall plates like the intermediates, which in turn carry the joists laid flatways, with pleasing effect. The piece is for sale by Messrs. Stevens and Co.

CHIPS.

The town council of Helensburgh, N.B., have accepted the tender, amounting to £3,939, of Mr. W. Wilson, Cathcart, for enlarging the upper reservoir to give an additional storage of 20,000,000 gallons, and also to provide a small reservoir, with a storage capacity of 2,000,000 gallons, on a higher level for supplying Upper Helensburgh.

Mr. John Priestman and family, of Sunderland, have given £6,000 towards the establishment of a new parish church for Roker and Fulwell. The ecclesiastical commissioners have given a site and £500 for the edifice. The church, which is to be erected very shortly, will cost £9,000, and a committee is arranging to raise the additional £3,000. A new parish will be formed, called either St. Saviour's or St. Andrew's, Monkwearmouth.

At the last meeting of the Somerset Drainage Commissioners the engineer, Mr. W. Lunn, presented a report and estimate upon works which he considered essential to the safety of the district, to be carried out to the Burnham sea-wall, south of the pier, and the north bank of Highbridge. His estimate showed a total of £2,693 4s. 8d. The finance committee recommended that part of the works be carried out at an estimated cost of £1,243. The recommendation was adopted.

The parish church of Tremaine, Cornwall, has just been reopened after extensive repair. It is a little Norman structure of nave and chancel only, the distance between the walls being only 12ft., and these have pushed outward by the thrust of the 15th-century carved cradle-roof. So dangerous had not only the walls of the church, but the tower also, become that the parish had decided to pull the building down altogether. However, under the supervision of Mr. Edward Sedding, of Plymouth, the walls have been buttressed and underpinned and rendered sound.

COMPETITIONS.

BRIGHTON.—The award in the Brighton Women's Hospital Competition has just been determined, the first prize being taken by Mr. John Denman, a Brighton architect, the premium being £50. The second premium of £30 is given to Mr. E. P. Howard, and the third premium of £20 is divided between Messrs. F. Pennington and J. S. Quilter.

THE PAVIORS' COMPANY AND THE STREET SUBWAY QUESTION.—An exhibition of the designs sent in to the Paviers' Company, in response to an offer of 150 guineas, in three prizes, for the best designs and essays on the subject of street subways, was held on Monday in the Old Council Chamber at the Guildhall. Nearly thirty competitors entered, the competition having been promoted on the initiative of the Master (Major L. H. Isaacs). The judges were the Master, Mr. D. J. Ross (the City engineer), Mr. J. W. Bradley (the City engineer Westminster), and Mr. W. Weaver (the engineer to the borough of Kensington). The prizes were 100 guineas, 30 guineas, and 20 guineas, and the respective winners were as follows:—Mr. R. M. Parkinson, 93, Lincoln-road, Peterborough; Mr. A. J. Price, Urban District Council Office, Lytham; and Mr. F. M. Royal, Third-avenue, Sherwood Rise, Nottingham. Each design was accompanied by an essay. The subway system originated in the City of London, where, however, little had since been done in its extension. In 1901 there were 2,540 lineal yards of subway under the control of the City Corporation, nearly nine miles of pipes, &c., being contained therein. In that year the City engineer reported that the subway in Queen Victoria-street was visited by no fewer than 15,325 workmen for various purposes.

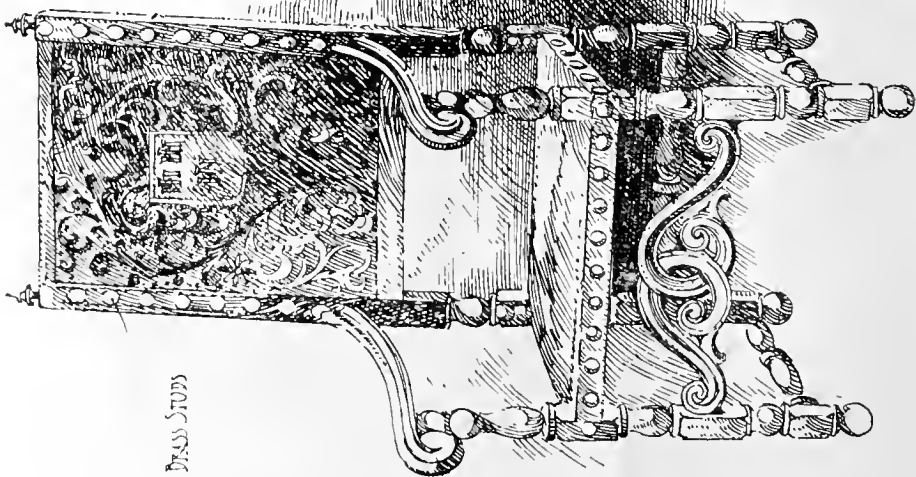
RAWTENSTALL.—The free library committee of the corporation met on Friday to receive the report of the assessors, Messrs. Butterworth and Duncan, of Rochdale, on the competition for proposed free library, town-hall, and assembly-room, on the Queen's Meadow, Rawtenstall. Upon accepting Mr. Andrew Carnegie's promise of £6,000 towards the cost of erecting a free library, the town council advertised a competition for designs, premiums of £100, £50, and £30 being offered for designs. The author of the first design will be appointed architect to erect the library buildings, and be paid in accordance with the R.I.B.A. scale of charges, conditionally on the corporation being satisfied that such design can be satisfactorily carried out, and that the successful competitor has had sufficient practical experience. The corporation does not intend to proceed with the erection of the town-hall and assembly-room, and the successful competitor will have no claim upon the corporation in consequence thereof, nor will he have any claim to be appointed architect should the corporation hereafter proceed with that portion of the work. The whole of the successful drawings will become the absolute property of the corporation on payment of the premiums. The cost of the library building was not to exceed £5,000, including furnishing and everything necessary for the occupation of building, except books. The cost of the town-hall and assembly-room was not to exceed £18,000 and £6,000 respectively, inclusive of heating, lighting, fire appliances, means of ingress and egress, and ventilation. The elevations were to be entirely of local "pitch-faced" stone, with Darley Dale or similar colour of stone dressings. The style of architecture was left to the competitors, but it was suggested that this should be simple rather than ornate in character. Twenty-two designs had, it was reported to the committee, been sent in, and the assessors had had some difficulty, on account of the merits of the respective designs, in awarding the second and third prizes. The successful competitor is design No. 5, sent in by Messrs. Crouch, Butler, and Savage, of Birmingham, whose plan was regarded by the assessors as the best submitted. The second premium was divided between designs No. 3 and 15, which were sent in respectively by Mr. A. T. Butler, of Cradley Heath, and Messrs. Stones and Stones, of Blackburn, acting in conjunction with Mr. W. Edwardes Sproat. The third premium was divided between designs 9 and 13, which were sent in by Mr. E. Jenkin Williams, of Cardiff, in collaboration with Mr. Edgar G. C. Down, A.R.I.B.A., also of Cardiff, and by Mr. Albert E. Dixon, of Leeds. The five premiated designs are on view in the mansion at Whitaker Park during the whole of this week.

GROUP OF JACOBÉAN FURNITURE.

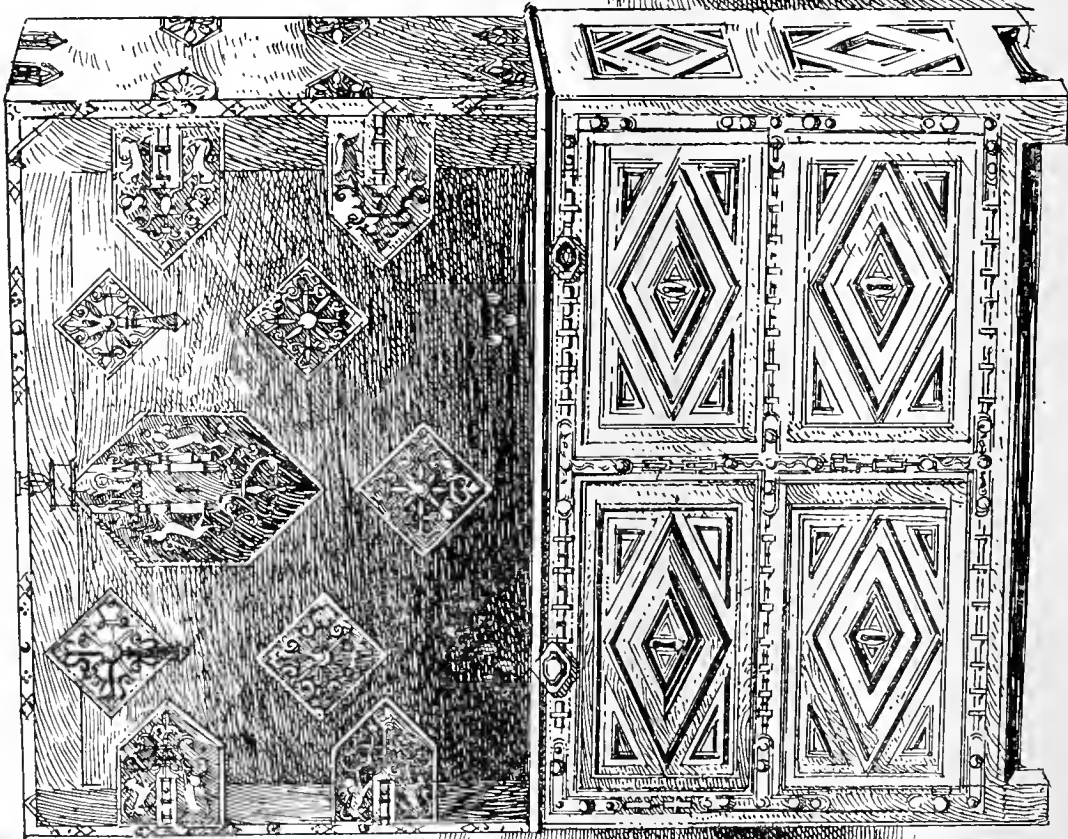


DETAIL OF METAL BOLT
PLATE

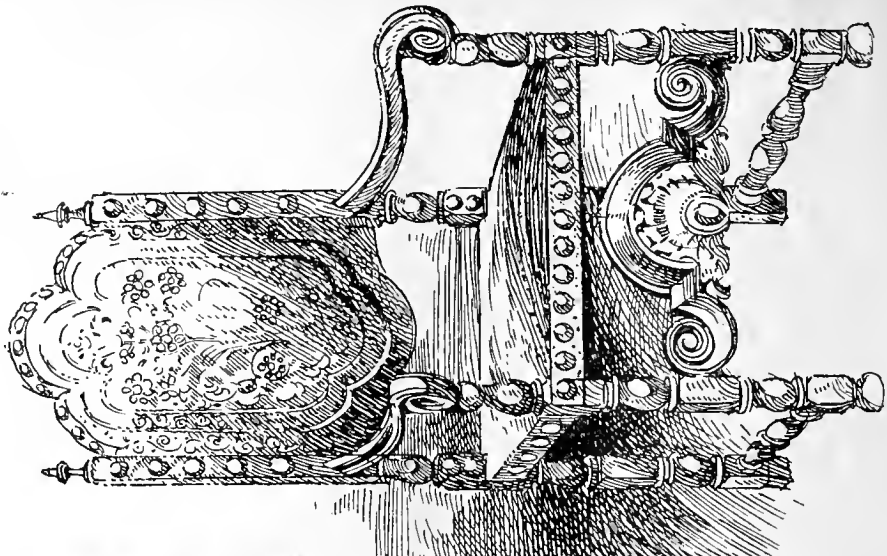
BRASS STUDS



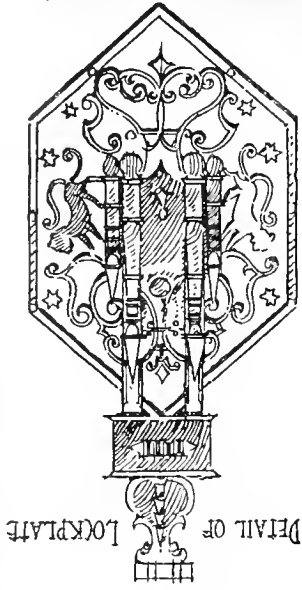
JACOBÉAN CHAIR LEATHER BACK AND SEAT



JACOBÉAN CHEST WITH GERMAN PINE ON TOP

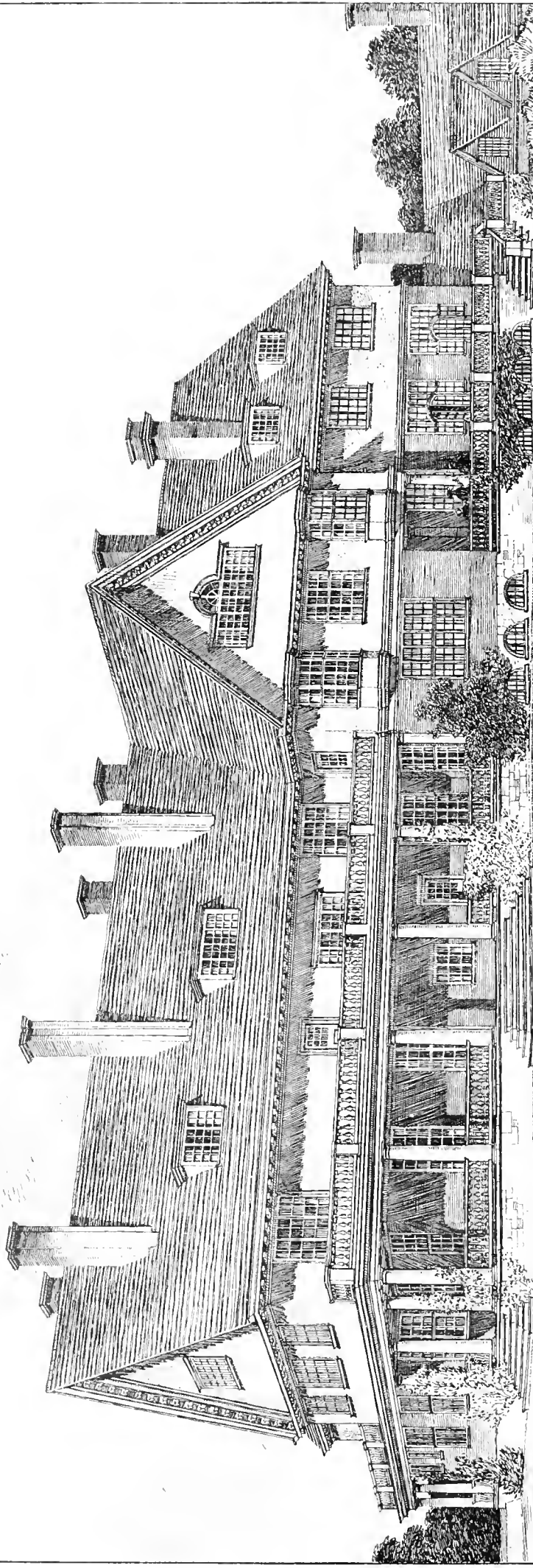


JACOBÉAN CHAIR LEATHER BACK AND SEAT

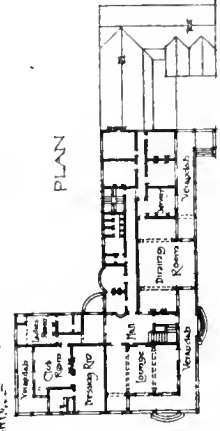


DETAIL OF
LOCKPLATE

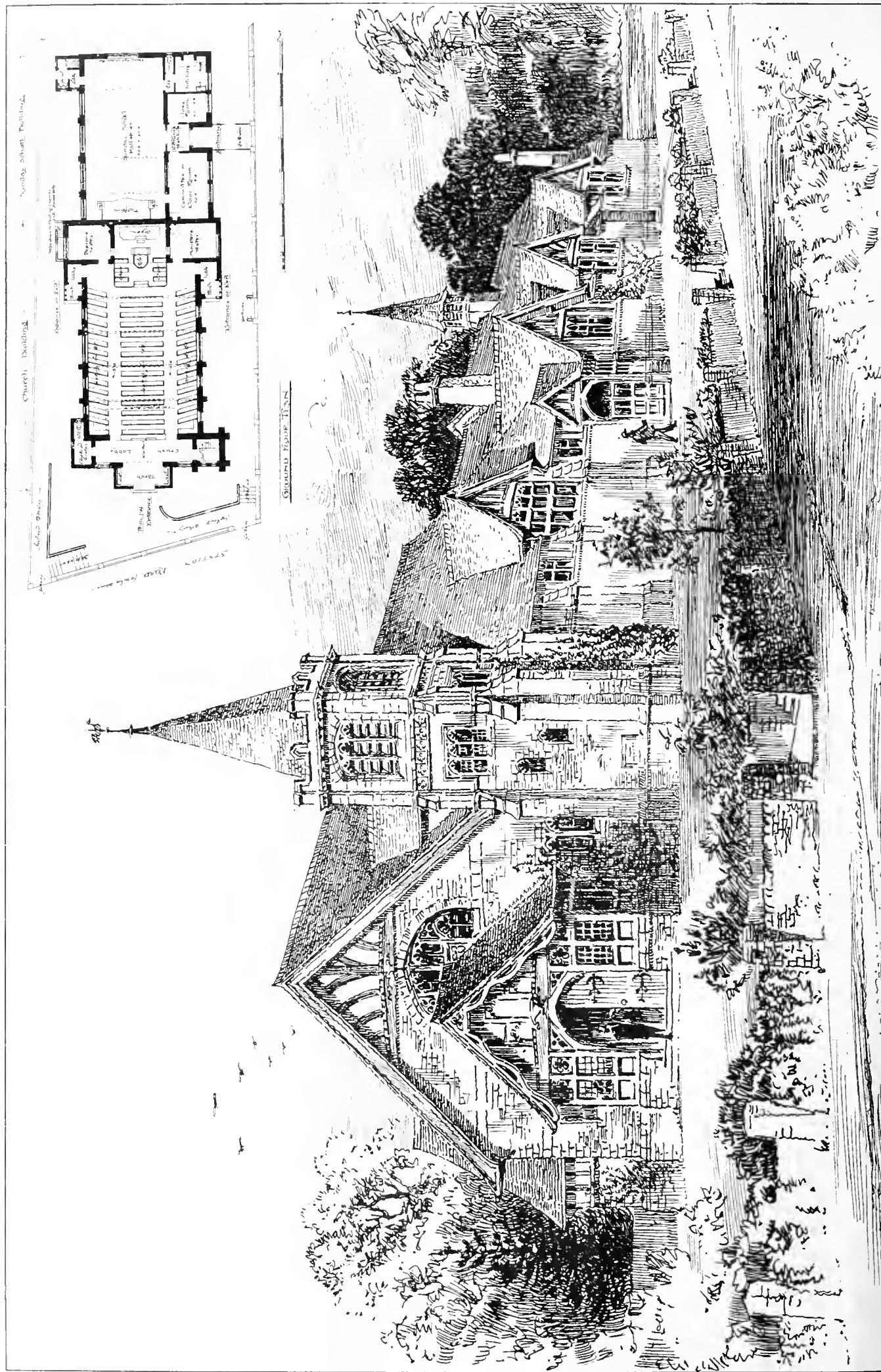
The Building News Nov. 27, 1903.



Seacroft
Golf Links
Hotel
Skegness
BREWILL & BAILY ARCHT'S
NOTTINGHAM

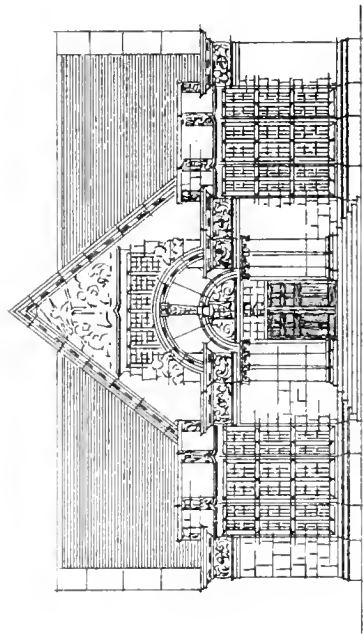


THE BUILDING NEWS, Nov. 27, 1903.

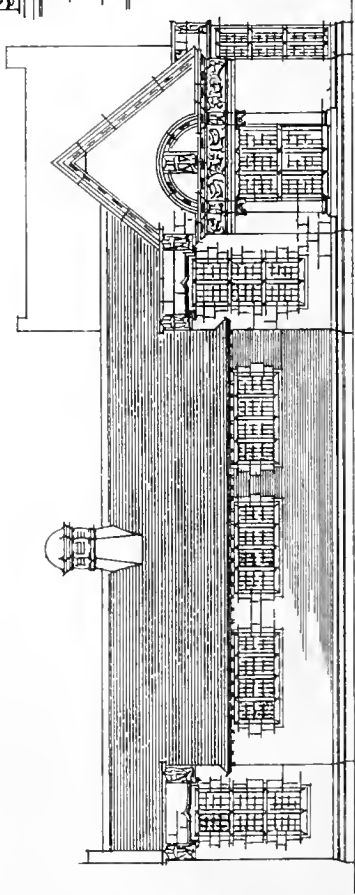
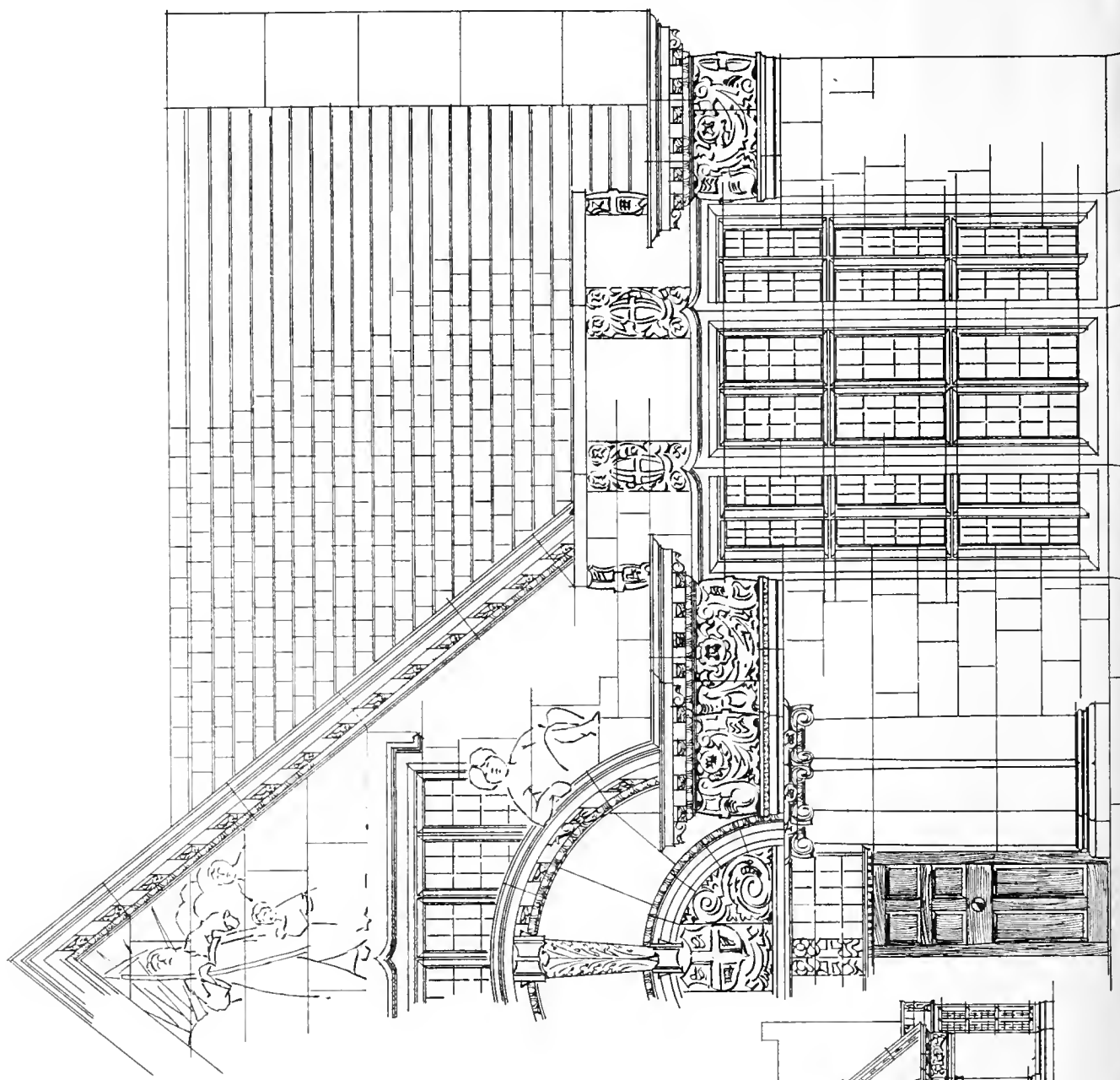


: CONGREGATIONAL · CHURCH · & · SCHOOL : JARVIS - BROOK · SUSSEX : ~ · W.C.F. GILLAM, M.S.A. ARCHITECT : BRIGHTON :

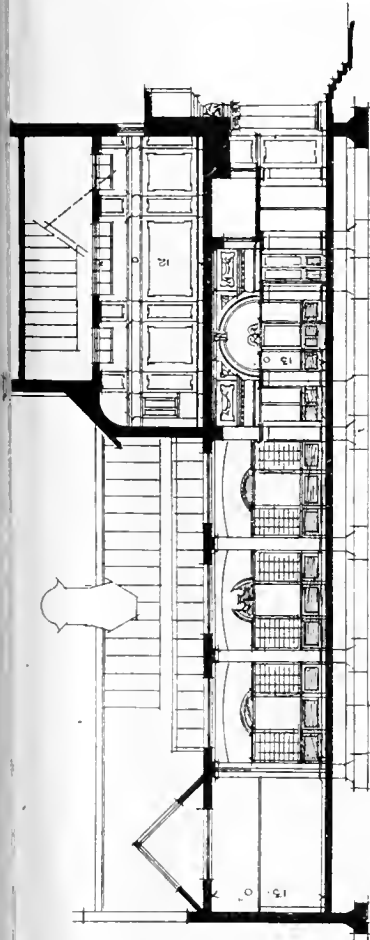




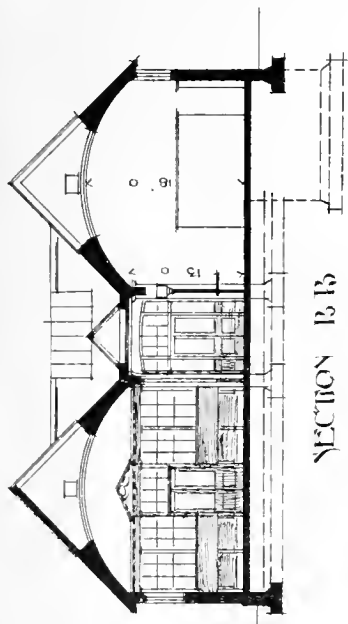
N.E. ELEVATION



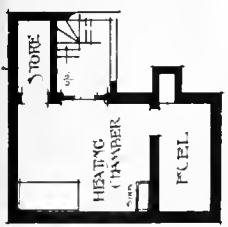
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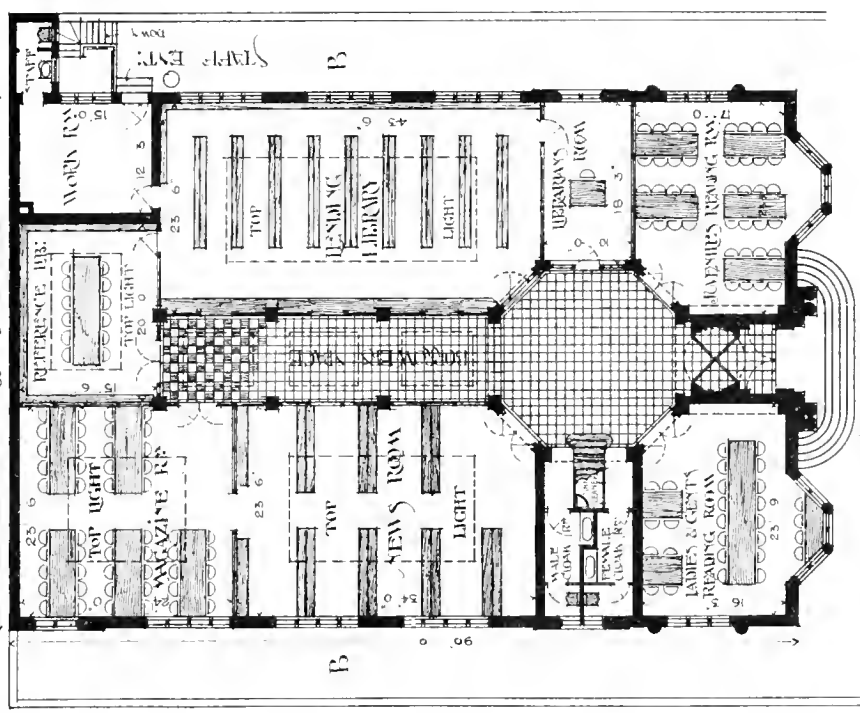
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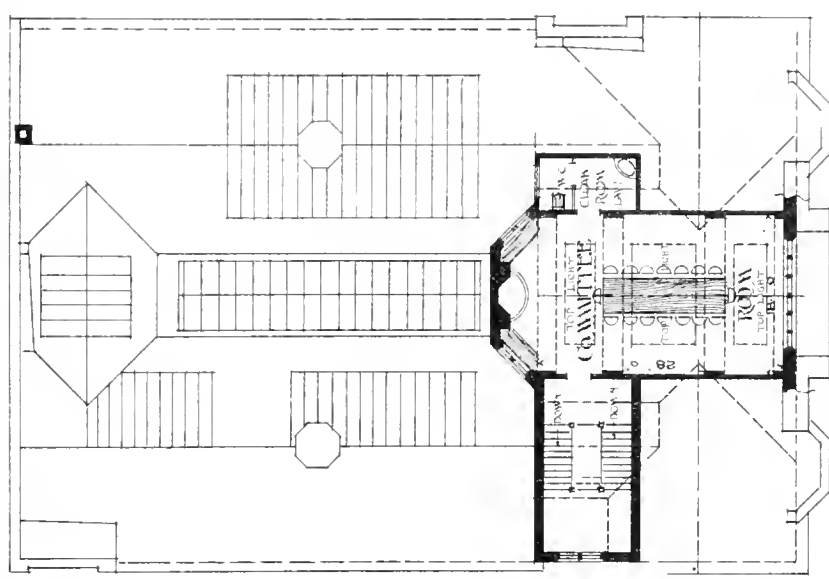
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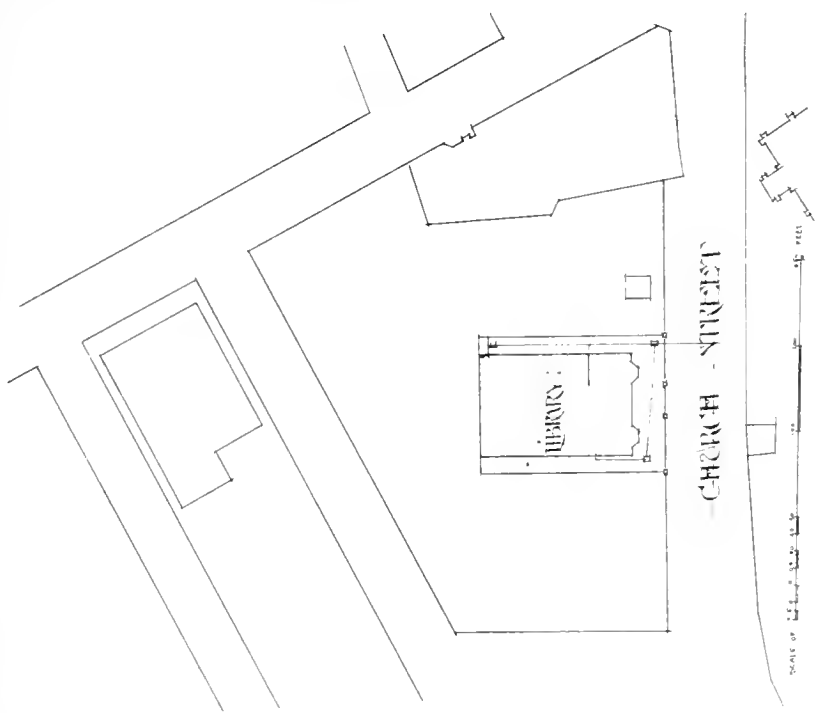
BASEMENT
(UNDER WORK ROOM)



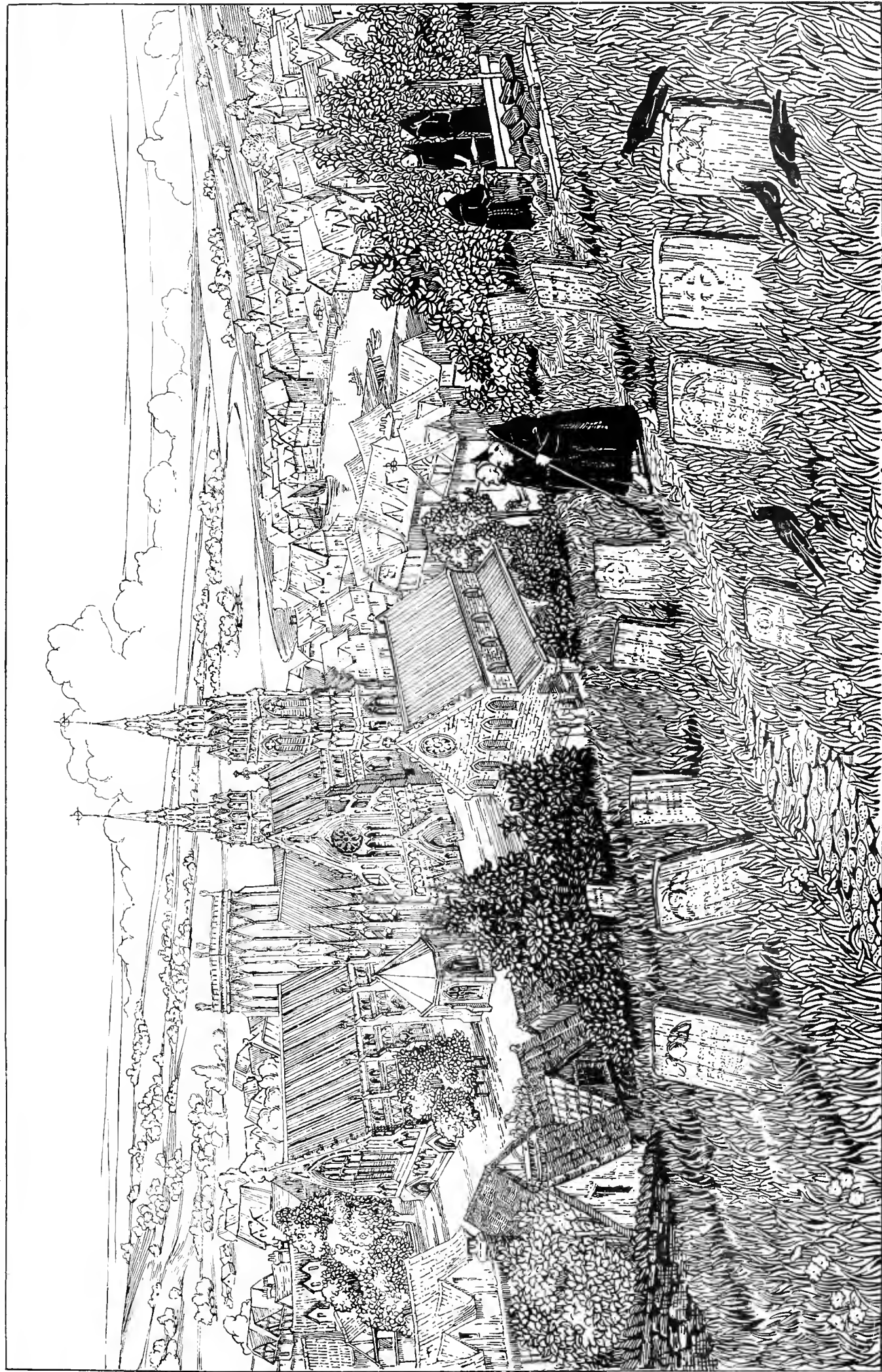
GROUND FLOOR PLAN



FIRST FLOOR PLAN



THE BUILDING PEWS. Nov. 27, 1903.



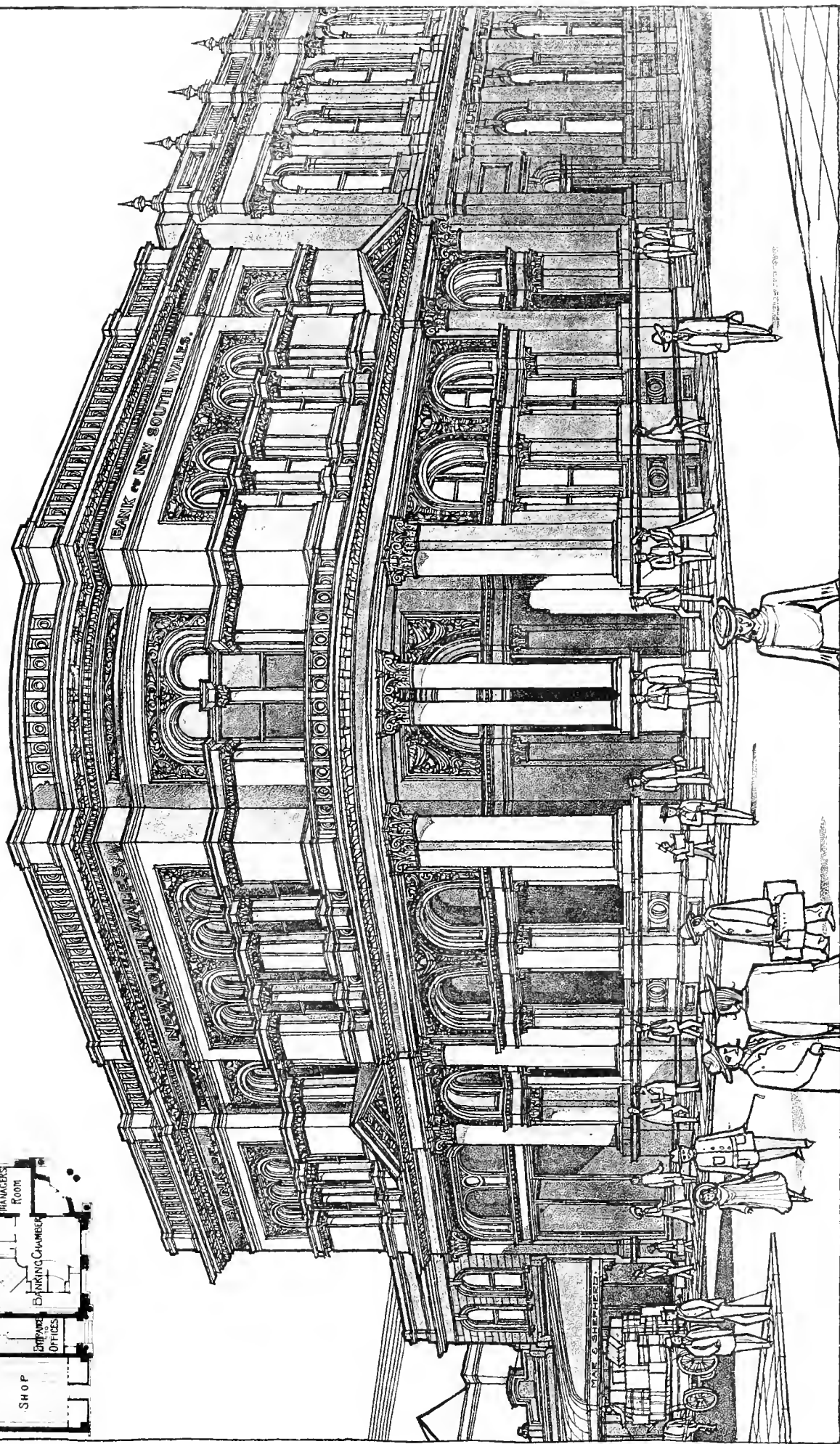
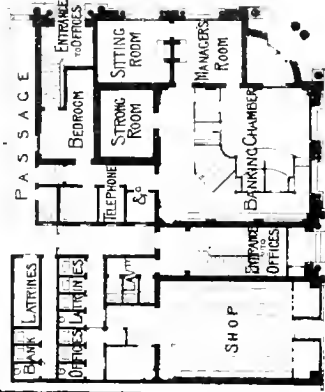
BRONZE MEDAL DESIGN FOR BOOK ILLUSTRATION BY RICHARD EDWARD CLARKE

Photolithographed & Printed by James Akerman 6, Queen Square W.C.

THE BUILDING, DEWS, NOV. 27, 1903.

BANK OF NEW SOUTH WALES, INVERCARGILL, NEW ZEALAND

A. BRODRICK, ARCHITECT



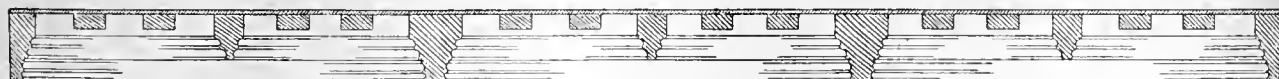
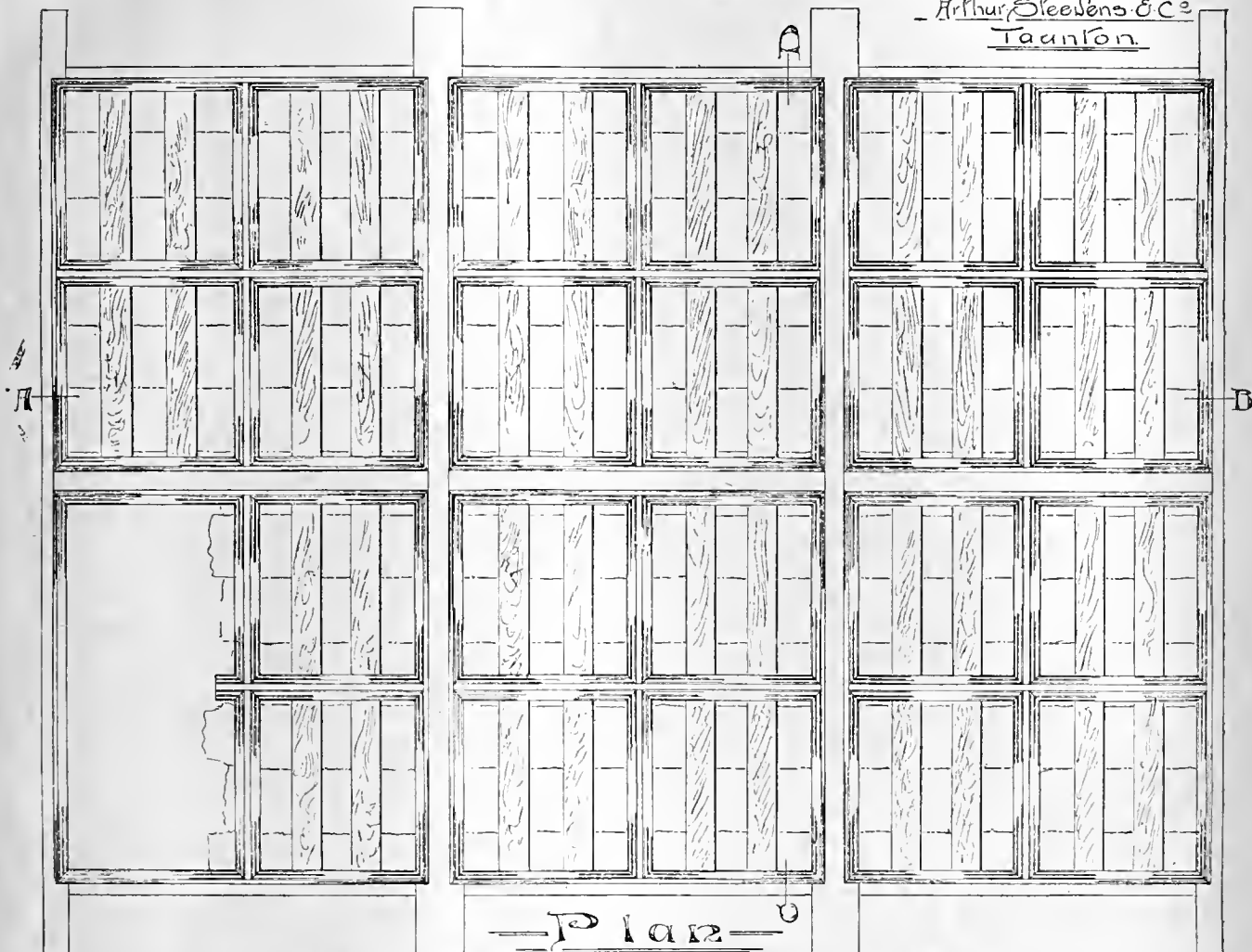
"PHOTO TINT" by James Akerman & Co., Queen's Square, London, W.1.

— Fine Antique Solid Oak Ceiling & Floor —

— Of the Period of Charles II. —

— Containing altogether about 145 cubic feet of Oak —

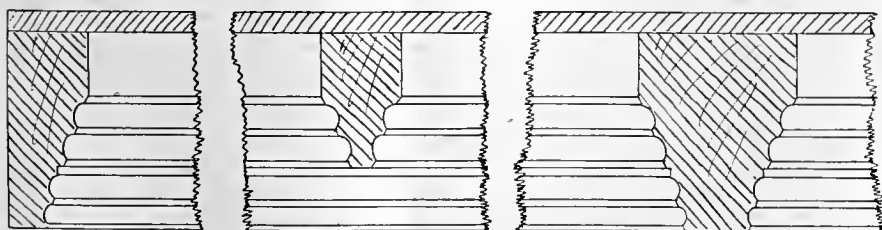
— Arthur Steeds & Co
Taunton.



— Section A.B —



— Section C.D —



Samson & Co
Architects Taunton
6th Oct 1903
5040
Detail of Beams

PROFESSIONAL AND TRADE SOCIETIES.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

—The annual meeting of the members was held recently at the Grand Hotel, Colmore-row, Birmingham, Mr. Albert S. Smith presiding. The annual report expressed regret that the depressed condition of trade referred to twelve months ago has continued during the past year. After again meeting the Operative Plumbers in conciliation, the committee had been unable to come to any satisfactory arrangement as to the code of working rules, the operatives declining to sign for less than three years. There were, therefore, no rules in existence with this branch. In view of the unreasonable demand of the National Association of Operative Plasterers in various parts of the country, the committee had given notice to the Operative Plasterers to abolish all existing rules after April next. With this exception, the committee had, after consideration, decided not to disturb the trade by serving notices for alteration of rules, although the present state of the trade fully justified notices to reduce the existing high rate of wages. On several occasions deputations had interviewed sub-committees of the Architectural Association on matters of importance in the interests of the trade, notably the interpretation of the Prime Cost Clause in the conditions of contracts, and "items of making good after other trades." The balance-sheet showed total ordinary receipts for the year £219, which, with the balance from last year, made a total of £391. The various disbursements amounted to £204, and there remained £187 to the credit of the association. In moving the adoption of the report and balance-sheet the President said that trade last year was bad, and since then it had visibly declined. They could not say that prices were low. Materials had not come down to any great extent. Labour was at the highest point it had ever reached; and so they could not quite say that building prices were low. Mr. William Sapcote seconded the motion, and endorsed what the president had said in reference to the plasterers. The motion was carried unanimously. Lieutenant-Colonel Barnsley was unanimously elected president for the ensuing year, and Mr. J. B. Whitehouse vice-president; Mr. G. Twigg was reappointed treasurer, Messrs. Thomas Johnson and J. S. Surman auditors, and Mr. E. J. Bigwood was re-elected secretary. On the motion of Mr. J. B. Whitehouse, seconded by Mr. C. Copeland, a vote of thanks was passed to Mr. Albert S. Smith for his services during the past year in the position of president. A dinner followed in the Grosvenor Room, and was largely attended. The chair was occupied by Lieutenant-Colonel John Barnsley. After the loyal toasts had been honoured, the toast "The City and Trade of Birmingham" was submitted by Councillor Whittall, who described, from a builder's point of view, the work carried on in some of the departments of the corporation, mentioning in particular the Public Works Department and the Drainage Board. Mr. Ebenezer Parkes, M.P., responded. Mr. Thomas Barnsley proposed "Success to the Birmingham Builders' Association." The toast "The Architects and Surveyors" was proposed by Mr. J. B. Whitehouse, and Mr. Arthur Harrison and Mr. Anthony Rowe responded on behalf of the architects and surveyors respectively. Mr. A. S. Smith, the new president, proposed the toast "National Federation of Building Trade Employers of Great Britain and Ireland." Response came from Alderman John Bower, the ex-president of the National Federation, and Mr. C. H. Barnsley (president of the Midland Federation).

BRISTOL SOCIETY OF ARCHITECTS.—At the opening of the session on Monday last, the president, Mr. Joseph Wood, F.R.I.B.A., entertained the members of the council at dinner, after which a smoking "At Home" was held at the Fine Arts Academy, Clifton. The president's hospitality met with a gratifying response in the presence of a very large gathering of members and architectural assistants and pupils, who inspected with the greatest interest a large collection of admirably-executed sketches and measured drawings, the result of the work of a long period of years by the president and his late partner, Mr. Forster. Many of the sketches dated from the early "forties," and illustrated bits of old Bristol that had now disappeared. After refreshments had been partaken of the president addressed a few words more especially to the student members, impressing upon them

the desirability of maintaining enthusiasm in their studies by sketching and measuring good examples of old and modern work.

THE BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—The eighth winter meeting, 1903-4, will be held at the Geological Society's rooms, Burlington House, W., on Saturday, December 12, 1903, when the chair will be taken at 11 a.m. Ballots will be taken for the council and officers for 1904-5, and for new members and associates. Balloting papers for council and officers are sent to members entitled to vote; balloting papers for new members and associates will be handed to members on entering the meeting room. Papers will be read, entitled "The Storage of Flood Water," by Professor Henry Robinson, M.I.C.E.; "The New Reservoir for the Hoylake and West Kirby Waterworks," by Alfred J. Jenkins, Assoc.M.Inst.C.E.; and "The Cogan Extensions of the Cardiff Corporation Waterworks," by Neil J. Peters.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

—The annual meeting of this society took place on the 19th inst. at the Queen's Hotel, Leeds, and was numerously attended. In his third presidential address, Mr. Butler Wilson, F.R.I.B.A., referred in terms of praise to City-square. By the munificence of Colonel Harding and the genius of Thomas Brock, R.A., he said, Leeds now possessed one of the finest equestrian statues in the world. The subsidiary features executed by Messrs. Drury, Pomeroy, and Fehr were also excellent examples of the sculptor's art, but he thought the value of these figures of Leeds worthies would have been greatly enhanced if they had been placed in some isolated situation. During the last few years Leeds had seen the sweeping away of vast blocks of dilapidated and insanitary property, and the upraising of structures, whether beautiful or not, at least fitted with every modern convenience and appliance. Broad thoroughfares had appeared, some of them leading to nowhere in particular. The electric tramways had created an inclination on the part of the authorities for rounded street corners; an inclination which had developed into a mania. Alluding to the making of new streets, Mr. Wilson said one was constrained to consider whether the arteries of traffic could be diverted by the tempting prospect of a broad thoroughfare which was even a little off the main line. Piecemeal improvements were futile unless they formed part of a prearranged scheme. Alluding to the aims of the society, Mr. Wilson said parents must be brought to see that for a youth to become an architect he must have a scientific course of training. But what experience or data had such mentors to judge of what qualifications an architect should possess? The status of the architect was less defined than that of a hansom-cab driver. Students went through a short, slipshod, aimless class of training, and were then pitchforked into the profession through the inexpensive medium of a brass plate and a terracotta catalogue. On the motion of Mr. G. Bulmer, seconded by Mr. H. S. Chorley (the hon. secretary), a vote of thanks was accorded Mr. Wilson for his address. A smoking concert followed.

SHEFFIELD SOCIETY OF ARCHITECT AND SURVEYORS.—The monthly meeting of this society was held the other night in the Lecture Hall, in Leopold-street, Mr. T. Winder occupying the chair. An address on "Architectural Education" was delivered by Mr. Hugh Stannus, of London, who remarked that it was a very good beginning for a man to have tried his hand at all three styles—the old Classical, the Mediaeval, and the Renaissance, in addition to the modern. A good knowledge of German would be found helpful, especially in the mastery of textbooks, and some idea of legal work would be sure to prove useful. A budding architect should also keep up his literary knowledge in order to be able to submit a lucid report to any public body. Mr. Stannus advocated that a professorship of architecture and architectural science should be created in Sheffield, in connection with the establishments of higher education. Such a professor ought to give lectures not only to those who were going to be architects, but also to those who were going to be their clients. The people would then realise that the work of an architect was not merely the designing of mouldings or the arranging of extra quantities to a builder. As a native of Sheffield he held that 50 years ago if their forefathers had been courageous, they would never have had the unsightly streets

that now give visitors such a poor opinion of the city. Those Sheffielders, continued Mr. Stannus, who had lived in the city all their lives did not know how the aspect of the place struck a stranger or one who had returned after some years' absence. Why was there not a worthy scheme carried out piece by piece, as occasion offered? The reason, unfortunately, lay in the fact that there was a 1st of November, when councillors were afraid of meeting citizens. He was bound to say a fine thing had been effected in the improvement of High-street and one or two other thoroughfares, but there was a host of opportunities still awaiting the attention of those who are patriotic enough to take advantage of them. A discussion followed, and on the motion of Mr. E. M. Gibbs, seconded by Principal Hicks, a vote of thanks was accorded Mr. Stannus.

CHIPS.

The thirty-first annual dinner of the Institute of Estate and House Agents was held on Tuesday night at the Café Royal, Regent-street. Mr. Ernest Pennington, the President, was in the chair, and Mr. T. Skewes-Cox, M.P., Mr. J. H. Towns-end Green (president of the Auctioneers' Institute), and Mr. W. J. Taylor (secretary) were amongst those present.

The Earl of Rosebery inaugurated yesterday (Thursday) the work of the County Council in commemorating London houses of historical interest by unveiling a tablet at Holly Lodge, Campden Hill, at one time the residence of Lord Macaulay.

Adjudications in bankruptcy have been made in the cases of John Holmes Greaves, Mattison-road, Harringay, N., King William-street, E.C., late Queen Victoria-street, E.C., architect; and of William Henry Waterman, Cullum-street, Fenchurch-street, E.C., architect.

In our report of the meeting of the Quantity Surveyors' Association last week, the chairman, Mr. W. Hoffman Wood was incorrectly described as an F.S.I. Mr. Hoffman Wood is not a member of the Surveyors' Institution.

The new schools, Acton Green, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At the inquest on Tuesday on the four men who were killed by the collapse of a viaduct in course of construction at Stanway, near Winchcombe, on the new Cheltenham and Honeybourne branch of the Great Western Railway, a verdict of "Accidental death" was returned. The jury appended to their verdict a rider expressing the opinion that sufficient time had not been given for the lime and mortar to set before the centres were removed; and, further, urging that arches of the kind in question, in winter months especially, ought to be set in cement and mortar.

In the appeal for a sum of £300,000 of the joint committee for the removal of King's College Hospital to South London which was recently issued, it was stated that an adequate site had been presented close to Camberwell-green. The site of twelve acres, at present known as The Sanders' Estate, is at the foot of Denmark-hill, close to Camberwell-green, and in close proximity to the three railway stations of Denmark-hill, Loughborough-junction, and Camberwell New-road. In addition to this convenience, the main electric tram lines run from Deptford, New-cross, Peckham, right through Camberwell-green, and a further line up Denmark-hill is now being laid down which will pass the doors of the new hospital.

The Reader in Egyptian Archaeology at Liverpool University, Mr. John Garstang, has completed arrangements on behalf of the Beni Hasan Excavations Committee for an expedition to Egypt during the coming season. The concession obtained from the Egyptian Government includes an extension of the field of last winter's exploration, the results of which were exhibited at Burlington House in July. A special feature in the season's work will be the examination of the great tomb at Negadeh, supposed by some to have been the tomb of Menes, the first of the great Kings of Egypt.

At Falmouth Mr. W. O. Meade-King has held an inquiry on behalf of the Local Government Board into the application of the town council for sanction to borrow £2,100 for the purchase of land and the making of a promenade on the bay side of the sea-front. The town clerk stated that the proposed road would connect Cliff-road and Gyllyng-road, and would be 35ft. wide. The land was a portion of the Gyllyngdune estate.

Mr. George Biss, the senior member of the firm of Geo. Biss and Son, builders, Portishead, expired suddenly about noon on Thursday in last week, while superintending the erection of some buildings near the Esplanade, Portishead.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LIII., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—G. Monck and Co.—M. F. A.—H. H. K.—R. J. Williams.—S. F. S.—J. M. B.—W. Day and Co.

J. T. GALLETTLEY.—We cannot, of course, say why your applications for particulars were not answered. We have no possible control over the managers of competitions. It is a matter you might bring to the notice of the Competition Reform Society.

"BUILDING NEWS" DESIGNING CLUB.

"FORCE," "ZIGZAG," and "THE KID." (These designs were not overlooked, but we regret that their names were not mentioned, owing to the loss of a page of our review. They were placed among the first series in making our choice. "Force" has many points of merit, with only one entrance, and a very dark passage-way cloakroom. The laboratories are much too small, and, like the art-rooms, are bad in shape. Externally the design is a little overdone. "Zigzag" has a too lofty central hall, with two staircases rising out of it, and the laboratories separated on different floors, the balance and preparation rooms being far away from the physical laboratory. The author is too ambitious, but able. "The Kid" also overdoes a simple problem, displaying ingenuity. The only access to his classrooms is by way of the hall, and the entrance-halls are too big for economy's sake.) The others were "Taquisara," "Desperate," "Lyric," "Sunny Jim," "Gwen," "Marksmen," "Lavernock," "Last Man In," "Mona," "Four Point Seven," "Whiteheather," and "Eagle."

DRAWINGS RECEIVED.—"Antocar," "An Old Scholar," "Frena," "Yew Tree," "Spero," "The Last Man In," "Frouge," "Val."

The parish church at Olney, in Buckinghamshire, which is so closely associated with the poet Cowper and the Rev. John Newton, is to undergo restoration at an estimated cost of £1,300.

Correspondence.

ARCHITECTS' SECRET COMMISSIONS.

To the Editor of the BUILDING NEWS.

SIR,—A correspondent calls attention to this matter in your issue of 20th inst. In my opinion it is one which calls for more urgent attention on the part of the R.I.B.A. and its allied societies than do all other matters now under their consideration put together. Not only are these secret commissions dishonest to the client, who pays far more than he ought to do for his goods, but the "architect" who takes the commissions dare not condemn bad workmanship and material. He is in the power of the contractor or tradesman. Consequently the client gets robbed twice over. Again, the secret commission architect can frequently obtain work against the honest man by offering to work for, say, 2½ per cent., against the other man's professional fee of 5 per cent. By secret commissions the dishonest man frequently receives 10 per cent. in all. All this is perfectly well known to the councils of the R.I.B.A. and allied societies; but notwithstanding the crying disgrace to the profession, no united move is made towards putting an end to this state of affairs, and it is not to be expected that individual members will lay information one against the other. To me such an action would seem as degrading as that of a spy. Many of the tradesmen and sub-contractors, &c., who have to pay these secret commissions to architects would, I know, be only too glad to see an end put to this tax upon them, and some of them, if approached by an authorised deputation from an architectural society, would give such a deputation ample information to work upon and to act upon. Probably one-third of the architects in this country receive these secret commissions now. —I am, &c., F.R.I.B.A.

CHIPS.

The Old Felstedian War memorial window in the chapel of Felsted School, Essex, will be unveiled by Major-General Sir W. F. Gatacre, K.C.B., and dedicated by the Bishop of Colchester, at 2.15 p.m., on Thursday next, December 3.

The Irish Board of Public Works are making considerable additions to the Limerick Post Office. Messrs. Ryan and Sons are the general contractors. The building will be fireproof, and Messrs. Mark Fawcett and Co., of Westminster, have been selected in competition to do this work.

During the last financial year 19 new United Methodist Free Churches were built, and 15 enlarged, affording increased accommodation for over 4,000 worshippers.

The Scarborough Harbour Commissioners have decided to join the local corporation and fishing interests in an appeal to the North-Eastern Railway Company to acquire the existing harbour at Scarborough, and enlarge it by the construction of a deep sea extension outside the east pier of an area of seven and a half acres, and a depth at low tide of 14ft. The approximate cost of the scheme is £250,000.

The Edward VII. Soldiers' and Sailors' Institute at Gibraltar was opened by Field-Marshal Sir George White, V.C., the Governor and Commander-in-Chief. The building has sleeping accommodation for 90 men, and has cost £11,000.

The city of Buffalo has just entered upon what the experience of other cities shows to be a costly and unsatisfactory experiment, in the establishment of an architectural bureau in the department of public works, where plans are to be made for the various buildings required by the city.

At the meeting on Monday of the Newton Abbot Urban District Council, Mr. A. J. Cornelius, who was the late Mr. Silvanus Trevail's chief assistant, was appointed as architect to carry out the work in connection with the Free Library and Technical Schools as the representative of the trustees and executor of Mr. Trevail.

The Hon. Lyulph Stanley, vice-chairman of the School Board for London, presided on Monday at the public opening of a new school in Kingsgate-road, West Hampstead. The buildings will be used as a senior mixed school for the accommodation of 450 boys and girls in the higher standards, and has also in connection with it a special school for about 60 mentally defective children. The buildings have cost about £18,000, and the site nearly £10,000. The contractors were Messrs. Lawrance and Sons. The designs were those of Mr. T. J. Bailey, the architect to the School Board, and the work has been carried out under the supervision of Mr. Westcott, the Board's clerk of works.

Intercommunication.

QUESTIONS.

[12027.]—Reservoir.—Will some reader kindly say if two coats of cement and washed sand, mixed 2 and 1, are sufficient to make a small reservoir watertight, and if not, what is the best covering for the walls? The tank is built of deep under-ground, with 14in. brick walls and a concrete bottom.—C. C. E.

REPLIES.

[12023.]—Breaking Strain.—H. Adams, in hand-book, gives, Table 133, usual allowance for dead load per square inch sectional area.

		BREAKING STRAIN. SAFE LOAD.	
		Tons.	Tons.
Mild steel:—			
Tension	28	7	
Compression	25	5	
Rivets in shear	24	6	
Cast steel:—			
Tension	35	8	
Compression	50	12	

The compression and shearing values assume that the parts are unable to bend. Approximate strength of girders. Safe load in tons distributed when supported at both ends and loaded uniformly. For steel joist—area one flange $\times 5 \times$ depth in inches \div span in feet, &c.—REGENT'S PARK.

[12024.]—Rainwater.—You can have nothing better than an underground tank for storing soft water in the country, with a sand filter. The water for drinking should be again filtered through one of the numerous patent filters. A galvanised cistern should be fixed below the roof to catch a portion of the rainfall for the use of the w.c. A pipe from the force pump would supply this in case of need. Drainage should be taken to cess-pool for use in gardens—otherwise to the fields, if you have land adjoining.—E.

[12025.]—Ancient Lights.—It would appear that your correspondent "Light and Air" does not read "Fletchers on Light and Air" quite as it should be read. Pages 22 and 83 to 87 of the fourth edition, I think, make it clear that the blocking up of the opening for twelve months should be before the completion of the period of the twenty years' enjoyment so as to come under section 4 of the Prescription Act, which enacts "that each of the respective periods of years hereinbefore mentioned shall be deemed and taken to be the period next before some suit or action." I must admit, however, that this perhaps might be expressed more clearly, and my joint author and myself will endeavour to do so in the next edition.—H. PHILLIPS FLETCHER, F.R.I.B.A., F.S.I., A.M.I.C.E., Barrister-at-Law.

Mr. W. H. Waterman and Mr. A. A. Abrahams, architects and surveyors, 7, Cullum-street, Fenchurch-street, E.C., have dissolved partnership. Mr. Abrahams will continue to practise at the same address in his own name.

The stained-glass windows placed in Wells Cathedral to the memory of Somerset men who fell in the South African war will be unveiled by the Earl of Cork and Orrery, Lord-Lieutenant of the County, to-morrow (Saturday) afternoon. The general subject of the window, which is placed in the north transept, may be described as "Kings and warriors in the making of England, centring in Alfred the Great." The work has been designed and carried out by Messrs. James Powell and Sons, the Whitefriars Glass Works, Tudor-street, E.C.

The total realisation of the sale of the extensive blocks of freehold property belonging to Lord Kensington, and including Edwardes-square, Kensington, which was sold by private treaty, and which covers an area of about seven acres, was nearly £300,000.

The housing committee of the corporation of Liverpool have received a letter from the Local Government Board approving the spending of £150,000 on the Hornby-street Improvement Scheme, and inclosing their sanction to borrow £64,840 for the purchase of the area; also their sanction to borrow £85,160 for the erection of buildings. The Local Government Board have also sanctioned, as part of the scheme, the erection by the committee of a number of shops and the provision of a recreation ground under the Housing of the Working Classes Act, 1903.

The Hull Sanitary Committee have determined that, in addition to closing unhealthy dwellings, they will protect the landlords by taking proceedings against those tenants who allow their homes to become dilapidated.

To perpetuate the memory of the late Rev. J. H. Scowcroft and Mrs. Scowcroft, a stained-glass window has been placed in St. Matthew's Church, Duddleston. The subject of the window is the "Calling of St. Matthew," introducing the saints after whom the five sister churches are named. The dedication of the window will take place next Sunday.

A new church at The Wyche—a rapidly-growing part of Malvern—was consecrated on Friday by the Bishop of Worcester. The style of the building is Early English—very simple and almost devoid of ornament. The cost was £3,800, and the whole amount has been raised by subscription.

WATER SUPPLY AND SANITARY MATTERS.

DALKEITH.—The new water supply for the burgh was recently inaugurated. For a long time past great inconvenience has been occasioned by the want of sufficient water in the burgh. In their difficulty the town council applied to the Edinburgh and District Water Trust for a temporary supply, in addition to the 100,000 gallons which for many years have been conveyed to the Dalkeith tanks at Easthouse from the Trust's reservoir at Rosebery. They agreed to give 30,000 gallons in addition; but it was found impracticable to convey anything like that extra quantity to the town. Operations were begun some time ago at Bridgend to sink an additional bore, and this has been done by Mr. W. T. Wylie, Linlithgow, under the directions of the water committee. It has been put down a depth of 284ft. The bore is 30ft. from the well, and an adit connects the bore and the well.

LYDNEY.—This town, situate between the river Severn and the border of the Forest of Dean, has been provided with a new system of water supply. The population is about 3,500, and the area is about 7,000 acres. The works include a pumping station at Ferneley Wood, about three miles from Lydney, with reservoirs on the Bream-road, near Rockwood, and about twelve miles of water main in and around Lydney for distributing the water. The pumping station comprises an engine-house with duplicate pumps, the motive power being a gas-engine with complete gas-producing plant, and an oil-engine. The two pumps are of vertical type, and both are capable of delivering 10,000 gallons per hour to the reservoirs, which are 300ft. above the pumping station. The reservoirs are capable of holding 190,000 gallons of water. They are constructed entirely of cement concrete, and are lined throughout with cement. A special feature in connection with the mains is a high-pressure or hydraulic main conveying the water from the reservoir to the high-level district, whereby the pressure is maintained and transferred to the high-level supplies. In the final test of the mains not a single joint out of 180,000 was found defective. The contractor for the engine-house, reservoir, and mains was Mr. A. S. Scull, of Redcliffe-street, Bristol, and the Duddridge Iron Works, Limited, of Stroud, supplied the engines and plant. The works have been designed and carried out under the superintendence of Mr. J. Fletcher Trew, of County Chambers, Gloucester.

LOWER KINGSWOOD.—The site proposed for the outfall works in connection with the second instalment of the Kingswood drainage scheme, and comprising the lower portion of the parish, is situate in the parish of Oldland, and is precisely the same as that recommended the parish four years ago by the engineer, Mr. A. J. Saise. The site is 30½ acres in extent, and is in the area of the Warmley Rural District Council. The system to be adopted is bacteriological. The sewage is brought down into tanks, and from the tanks it is taken over a filter-bed made of clinkers in order to get exposure to the air. The sewage is distributed over the filters by patent distributors. Storm-water is diverted to a specially-prepared filtering area, and the filtrate, together with the discharge from the primary filters, is discharged into a tributary of the Avon—viz., Siston Brook. The estimated outlay is £11,500.

The new post-office at Spennymoor, Co. Durham, was opened on Friday. It is situated in Tudhoe-grange Market. The contractor was Mr. William Lazonby, of Ferryhill.

The Local Government Board inspectors, Mr. E. P. Burd and Mr. H. Percy Boulnois, C.E., sat for five days of last week at Plymouth, ending on Saturday, to inquire into the application of the Plymouth Town Council for sanction to borrow £248,252 in respect of capital expenditure incurred for electric lighting, sewerage, street improvements, parks, labouring-class dwellings, and other works; £3,000 for repairing Sutton-road; and £6,700 for electric lighting.

St. Anne's Church, Edgeside, Lumb Valley, will be reopened to-morrow (Saturday) after renovation and internal decoration. Mr. E. Hult, of Percy, is the builder, and the decorators are Messrs. Lord and Hodgson, of Waterpool. A stained-glass window has also been placed in the church as a memorial.

The Leeds tramways are to be extended some dozen miles in all during the next few months at a cost of £100,000. The Elland-road line is to be extended to Churwell, and a branch from Elland-road is to run along Domestic-street and Holbeck Moor-road. Lines are being laid along Stanningley-road and Compton-road to the east. The Stanningley-road line is to be carried a distance of 2½ miles to the boundary at Rodley, whilst the Whitehall-road and Kirkstall-road routes are to be extended, the one to the city boundary and the other to Calverley-lane End in Horsforth. New lines are also to be laid in Great Wilson-street and Waterloo-road.

Our Office Table.

"ART *contra* the World, the Flesh, and the Devil," was the title of a lecture delivered by Sir Wyke Bayliss on Sunday night before the London Spiritualist Alliance, at the Salon of the Royal Society of British Artists. The main topic was the duties of Art, in fighting side by side with Religion, the battle of life against the "common enemy." Religion and Art, the lecturer said, seemed always to be tied together in the relation of mistress and handmaid. It was an alliance of two forces, Spiritual and æsthetic, moving in the same plane, to the same end, against that common enemy. It involved a recognition of the relationship between us and God, and, in that sense, the two forces could not be separated. The common enemy was strong, but love was stronger. The force of Art was greater than gold, or, if not greater, at least it was more subtle, and more adapted to our needs. True Art, not merely in sculpture and painting, but in music and literature, was eyes to the blind, strength to the weak, gentleness to the strong, manhood to youth, restitution to the wronged, greeting to the absent, faith to the doubting, love and charity to all. Without the hope of life that came with Christ, Art would never have built our great cathedrals and temples of worship. As for the artist, it was enough that he lived, and worked, and died; but Art passed into the national life, and became immortal.

Among the Parliamentary projects for next session of interest is that of the City Corporation, who will apply for powers to rebuild Southwark Bridge, and also to discontinue the use of the high-level footway of the Tower Bridge. In view of the approaching completion of the Great Northern and City and Great Northern, Brompton, and Piccadilly Railways—tube lines to run from Finsbury Park to the City and West-end respectively—the directors of the Great Northern Railway will seek powers next session for the widening of their High Barnet branch between Finsbury Park and Finchley, so as to provide three tracks instead of two between those points. The scheme will involve the rebuilding of the stations at Strand Green, Crouch End, Highgate, and East Finchley. Some sixteen minor branch lines are contemplated by the Bill to be introduced by the Great Western Railway Co. These include a new line from Llanelli to Llansamlet and Coedffranc; another from Bettws, Carmarthen, to Llangnick in Glamorgan; new junction lines in Swansea, Grafton, Camerton, Monkton to Limpley Stoke, Dunston, Rowley Regis, and from Gloucester to Filton and Stoke Gifford. The Metropolitan District Railway seek powers to extend the subway at South Kensington as far as the Albert Hall, and also to charge on their system of lines uniform or zone fares. The Postmaster-General will seek powers to acquire lands, houses, and buildings in the Metropolitan boroughs of Holborn, Greenwich, and Lewisham, the urban district of Southgate, Middlesex, and the boroughs of Blackpool, Leeds, and Newcastle-upon-Tyne, for the service of the Post Office.

The report to the Government of India on the work of the Geological Survey for the past official year says that in the field of economic inquiry definite and satisfactory results have been yielded by the investigations into the occurrence of coal in parts of the Punjab, and near Shillong in Assam, of chromite in Baluchistan, and of iron ore in the Dhar Forest. Evidence has also been obtained of geological features favourable to the occurrence of petroleum in Burma; but less definite results have followed the investigation of the auriferous areas in Chota Nagpur. Gold is widely distributed in the reefs and alluvial deposits; but it is not clear that it is concentrated anywhere in paying quantities. The area, however, has not been exhausted by the investigations; but the explorations will not be continued by the Government. Much progress has been made in mapping previously unsurveyed ground in Madras, the Shan States, the Assam hill region, and forest tracts in Central India. The geological department may be expected in the future to take an active part in the development of the country, as the exploitation of its mineral wealth is now proceeding at a constantly increasing rate. Its inquiries of an economical nature are of pressing importance, and it will be judged largely by the aid it is able to give in working the natural resources of India.

In the near future effect is to be given to a big

building scheme at Stechford, near Birmingham. An estate of fifty-two acres has been acquired, and a newly-formed company, with a capital of £20,000, is to exploit the area for the building of house property. On the one side the estate extends along the railway towards Marston Green, and the site affords space for between nine hundred and a thousand houses. A few of these on the lower or north side of the railway will probably be let at 7s. 6d. or 8s. per week; but in the case of those on the south side of the line the rental will be 9s. or 10s. Each house will have a bath, and the company is to plant the gardens with a number of fruit trees, and in other ways—by means chiefly of horticultural prizes—induce the tenants to take an interest in their gardens. The streets are also to be lined with avenues of trees, and there will be two miles of roads. To avoid the monotony of style so common to suburban Birmingham, it will be stipulated that not more than four houses shall be exactly alike.

In their report to the corporation of Bristol on the condition of the Old Dutch House at the corner of High-street, in that city, Messrs. Douglas and Minshull, of Chester, state that as the result of their examination, externally and internally, it is evident that the building would require considerable repairs. As to the possibility of setting back the ground floor so as to effect a desired street improvement without disturbing the upper part, they state that having regard to the tracing submitted to them showing the proposed new line of footpath, they think that the superstructure will not lend itself to such a treatment, and that the height at the angle under the overhanging first floor would be inadequate for roadway requirements, whilst the lighting of the shop would also be interfered with. Messrs. Douglas and Minshull add that they have prepared a sketch showing how the building could be set back to the proposed improved line of roadway, using the old framework as far as possible, and reconstructing it on the new line, by which means the characteristic features of the structure would be preserved and a street improvement secured.

M. REDON, architectural expert of the Louvre Museum, announces that the Louvre Palace lies buried to a depth of 7½ metres, or over 24½ft.—that is to say, nearly a third of its entire height. M. Redon explains that he had a trench dug in a garden adjoining the Louvre, and brought to light a magnificent stonework sub-structure before reaching the foundations. This buried portion is described as being fully as fine as the basements of the grandest Florentine palaces. M. Redon has come to the conclusion that in the original scheme a moat, some 50ft. wide, was to have surrounded the palace, but it could not be excavated to its full width, as at the time the building stood in the midst of houses. When the latter disappeared the original plans had been forgotten, and the level of the soil gradually rose to its present height. The committee for the preservation of old Paris has taken up M. Redon's discovery with enthusiasm, and as soon as funds can be got together the excavation of the moat whence the noble frontage will rise at last to its full height will be begun.

An aerial ropeway from Gatehouse Quarry, near Loch-na-Craig, to Aberfeldy Railway Station, constructed for the Highland District Committee of the Perth County Council, was inaugurated the other day. For several years past the committee have had a heavy expenditure in connection with the working of their road-metal quarries. The bulk of the quarries being situated high up in the hills entailed a heavy carriage before the metal was got to the main roads. In order to remedy this, the district committee, on the advice of Mr. William Bell, C.E., road surveyor, resolved to construct an aerial ropeway for the conveyance of broken road metal. The ropeway is about 2½ miles in length, and consists of an endless wire rope running on pulleys on the top of steel trestles about 30ft. high. Hung from this wire rope are a hundred iron skips or buckets, each capable of carrying 2cwt. of broken metal, or about 80 tons per day of nine hours. A steam engine of 25H.P. at the quarry drives the ropeway, the stone-breaking machine, and rock drill. The cost of the ropeway was about £4,000.

The Stretford Urban District Council have received from Mr. Ernest Worrall, their engineer, a report on the use and merits of concrete flags for pavements, based on two-and-forty replies from authorities who are utilising these flags. The

almost universal statement is that in initial cost flags made of concrete are cheaper than natural quarry stones, while concrete flags are regarded as durable so long as they can remain undisturbed for repairs to mains. In the matters of foothold and appearance, they are generally regarded as equal or superior to quarried flags. The usual thickness is 2½ in., and to secure a satisfactory flag the concrete must be machine-pressed—a point which Mr. Worrall in his summary of replies regards as a *sine qua non*.

The American Consul-General at Berlin, in a recent report, describes cement manufacture as one of the great and long-established industries of Germany in which the capacity for production is excessive and disproportionate to the normal consuming power of the people. In 1901 Germany consumed 14,600,000 barrels of cement, while the producing power of the factories was 29,000,000 barrels per annum, so that production is double the home consumption. It is believed the excess in 1901 was 10 to 12 million barrels, of which the export only reached 506,652 tons, "leaving a large excess, which broke down the market, reduced profits to a pittance, and brought on a crisis in the industry from which it has not yet recovered." The postponement of the work on the Rhine-Elbe Canal, for which the cement factories had prepared, contributed to over-production. Efforts were made to form an all-embracing cement trust to restrict production, but in vain; the supply everywhere exceeded the demand. The general industrial and financial depression caused building to slacken, while labour and fuel—two main elements in cement production—remained as high as before. Exports formed the only resource, and these increased from 497,780 metric tons (2,205 lb. each) in 1898 to 641,520 tons in 1902. Of this the United States took 246,726 tons last year, British South Africa 36,720, and Great Britain 33,534. To shut out an import of about 50,000 tons from points immediately over the frontier in adjacent countries a duty has been imposed on imported cement, which was formerly free of duty. The Consul-General adds that only the oldest and largest German factories, with every advantage of position, are able to earn any substantial profit at present, and many of the newer and smaller establishments are working at a loss.

DUPLICATION of iron and steel members has, says the *Engineering Record*, been secured in a remarkable degree in the Varick Realty Building at Hubbard, West and Washington streets, New York; Mr. W. H. Birkbine, architect. The building is about 229 ft. by 116 ft. in area, and eleven stories high above the basement, having twelve tiers of steel beams and cast-iron columns. The self-supporting walls are entirely independent of the framework, but do not carry any of the floor load. The interior columns are round and the wall columns are square, all made with standard details for connections, and planed flange joints. They are seated with heavy cast-iron pedestals on concrete piers, with pile foundations. One sheet of the detail drawings calls for 915 columns, and another sheet, with three sketches, calls for 3,379 floor beams. The whole job is detailed on 24 in. by 30 in. tracings, and has a total weight of about 2,700 tons. It is being erected by means of several stationary derricks with very long booms. The J. B. and J. M. Cornell Company are the contractors, and Mr. H. H. Forsyth is in charge of the detailing of the framework for the building.

The new rifle barracks at Winchester, which have been built in place of those destroyed by fire a few years ago, are now ready for occupation, and are about to be taken over by the Rifle Depot, under the command of Colonel H. R. Mends, from Gosport. When the quarters at Gosport are vacated they are to be completely overhauled and repaired before being occupied by a line battalion.

The city council of Belfast have voted a gratuity of £250 to their assistant surveyor, Mr. Munce, for having discharged the entire duties of the office of surveyor during the past fourteen months.

The monument to the men belonging to H.M.S. *Doris*, who fell during the South African War, will take the form of a monument to be erected in the Park at Devonport, from designs by Messrs. Harry Hems and Sons, of Exeter.

At Monday's meeting of the Council of Ripon plans of the proposed Spa buildings and baths were laid on the table. It was stated that the plans would be submitted in detail to the sanitary committee, and that Mr. W. Stead, of Harrogate, had been appointed architect at an inclusive fee of £250.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Business Meeting. 8 p.m.

Society of Arts. "Mining of Non-Metallic Minerals." Cantor Lecture No. 2, by Bennett H. Brough. 8 p.m.

TUESDAY.—Institute of Civil Engineers. Discussion on "The Distribution of Rainfall over the British Isles." 8 p.m.
Institute of Builders. "A Comparison of English and American Methods of Building." by C. Heathcote, F.R.I.B.A. 8 p.m.

WEDNESDAY.—Society of Arts. "The Fiscal Problem." by Sir C. Malcolm Kennedy, K.C.M.G., C.B. 8 p.m.

FRIDAY.—Architectural Association. "Photography for Architects." by Members. 7.30 p.m.

SATURDAY, DEC. 5.—Sanitary Institute at Leicester. Discussion on "The Collection of Town Refuse." 11 a.m.

THE ARCHITECTURAL ASSOCIATION.

DECEMBER 14th: ORDINARY GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. PAPER by the A.A. Camera and C.-clung Club on "Photography for Architects," to be read by Mr. FRANCIS R. TAYLOR, illustrated by lantern views.
LOUIS AMBLER } Hon. Secs.
HENRY TANNER, Jun. }

CHIPS.

Mr. W. H. Grimsdale, chief engineer of the Warrington Electricity Department, and manager of the electric tramways, has resigned upon having been appointed to superintend the electrification of the Government dockyard at Portsmouth.

The Dean and Chapter of Rochester have decided to rebuild the central tower of the Cathedral from plans by Mr. C. Hodgson Fowler, F.S.A., of Durham. The design will be in harmony with the rest of the building; it will closely resemble the original tower, and, like it, will be capped by a spire in oak and lead. The donation of £5,000 recently given to the Dean and Chapter by Mr. T. A. Foord, a native of Rochester, will be applied towards this work.

At Colne, Lancs., on Tuesday, Major Druitt and Colonel Trotter inspected on behalf of the Board of Trade the new line constructed by the Colne and Trawden Light Railway Company. The new line joins on to the Nelson Corporation tramways, and completes a large electric tramway system, joining several of the main centres of population in North-east Lancashire.

A meeting of the Ordained Surveyors' Students' Society was held in the Edinburgh Architectural Association's rooms, 117, George-street, on Monday night. Mr. Carrick occupied the chair. Mr. T. Fairbairn, ordained surveyor, read a paper on "Valuations."

Considerable distress prevails amongst the brick-makers and general labourers in the Black Country, and at the West Bromwich Board of Guardians, on Monday, the ex-mayor of the borough (Mr. Cheshire) proposed that extra relief be given for three months to the outdoor poor of the union. The resolution was lost, but the relief committees were instructed to favourably consider the applications for extended relief necessitated by the cold weather.

The reopening and reconstruction of Wretton Church by the Suffragan Bishop of Thetford took place on Tuesday week. This church has for some weeks past been in the hands of Messrs. Hawes, contractors, of Norwich, undergoing extensive repairs. The repairs consisted of reseating the church throughout, lowering and retiling the floor, replastering the walls, and repairing the roof, the cost being about £240. The tower of the church was restored about three years ago at a cost of £220.

The extensive premises of Messrs. Thornton and Sons, building contractors, Thornton-place, Toxteth, Liverpool, were gutted by fire on Sunday.

Bishop Alan Webb (Dean of Salisbury) dedicated, on Wednesday, the ancient chapel of St. Catherine, "the Chapel in the Woods," Milton Abbey, which was founded by Athelstan, and which has been restored by the generosity of Mr. Everard Hambro. Since the Reformation the chapel had fallen into disrepair, and had been used for various secular purposes.

The Archbishop of Canterbury visited Herne Bay on Friday, and consecrated a chancel which has recently been added to the Church of St. John the Evangelist. The church itself was consecrated in July, 1893. The new chancel is in the Decorated Gothic style, with sedilia and credence in the south wall. The east window comprises five lights, representing the Annunciation, the Nativity, the Crucifixion, the Resurrection, and the Ascension, surmounted by a round light representing Christ in Glory. The design was carried out by Messrs. Percy Bacon Brothers. The choir stalls are carved in oak. The church has cost £11,000.

The church of All Saints, Penfai, near Bridgend, which has been built at his own cost by Mr. R. W. Llewellyn, was consecrated by the Bishop of Llandaff on Monday. The church has been built to Mr. Llewellyn's own designs, and contains sculpture which he brought from Florence, and an alabaster reredos, of which the central panels were designed by Mr. Goscombe John, A.R.A. In the tower bells have been placed named after members of the Llewellyn family, and the principal stained-glass window in the church is placed there by Mr. Llewellyn and his sisters as a memorial of their father.

The President and Council of the Royal Academy will, on Dec. 15, proceed to the election of a Cooke annuitant. This annuity is of the value of £35, and applicants for the same must be painters in oil or water-colour, not less than 60 years of age, and in distress from age, sickness, or some other cause.

St. Peter's, Newton, in the parish of Oystermouth, at the Mumbles, was consecrated on Thursday in last week. The new church, which has cost about £7,000, stands on a corner site overlooking the Bristol Channel and the district around. The style adopted is Decorated. The aisle windows are pointed, and the clerestory windows square, with traceried heads. The tower, not yet built, will be placed at the south-east angle of the nave, and will rise to the height of 90 ft., with a staircase turret, giving access to each floor and to the roof, and large enough to contain a peal of bells. The total inside breadth of the church is 56 ft., and the length 119 ft. The chancel is 25 ft. wide by 37 ft. long. The church, when completed, will accommodate over 600 persons. The nave and aisles will be furnished with chairs, while the chancel is to be fitted with oak stalls. The architect is Mr. E. M. Bruce Vaughan, Cardiff.

At Walton-on-Thames Church a further discovery in the south wall of the chancel has been made, bringing to view a sedile of the Perpendicular period, constructed of grey stone, and measuring about 4 ft. high by 2 ft. wide. This is situated between the ambry discovered a short time ago and the piscina, but not nearly as ancient as the former, which is of very crude workmanship of early style, and made partly of a chalky stone, whereas the latter is partly of freestone. The three niches form a very picturesque group, and should cause much interest to archaeologists, owing to the different periods of their construction and the marks and inscriptions cut in the seat and sides of the sedile. The investigation is under the supervision of Mr. A. E. Gough.

By order of the First Commissioner of Works, a new entrance is being constructed to Bushy Park, near the Hampton Court barracks, by the west side of the Royal green opposite the Trophy-gates entrance to the Palace. The entrance will include a single gate, with a large pair of gates at the side, but the latter will be used only on special occasions. As a part of the scheme a small bridge is to be thrown over the stream by the side of the Row paddock, and the locked gates at each end of the Pheasantry will be opened. By this new addition a more direct route will be secured to Hampton Court for the residents of Upper Teddington and Hampton-hill.

Parliamentary sanction is to be sought by a company to be formed for the purpose of constructing a pier at Broadstairs, which will commence just south of Victoria Gardens, and will run out into the sea for a distance of 1,300 ft.

Mr. Olley sold by auction on Wednesday, Christ Church, South Wimbledon, together with its accessories. The building, a large iron one situated at the corner of Graham and Hartfield roads, was originally transferred from Newington, and the work has now ceased. For the building the preliminary bid was £10 and the final one £70, for which the building was sold to the South London Joinery Company. The pews realised £2 19s., making an average of 1s. per pew. Commandment, Creed, and hymn tablets were sold for a total of 5s., and the pulpit fetched 15s. The stone font was sold for a guinea, a dial clock for 26s., and the "vestry," a wooden erection, for 8s. With the numerous other accessories—stoves, iron piping, matting, hymn-books, collecting-boxes, and alms-plate—the sale realised £83 11s.

At the north-east entrance to Islip Churchyard, which surrounds the church, a lychgate has been erected by the Agutter family. The work was carried out by Mr. Charles Pettit, builder, of Thrapston, from a design by Messrs. Townsend and Fordham, architects, of Peterborough. It is constructed of oak and pitch pine on Weldon stone bases, and covered with red Broseley tiles, surmounted by a cross.

For a long time past the condition of the sewers in Princes-street, Edinburgh, has been a source of trouble to the burgh engineering staff, as well as to the inhabitants of that thoroughfare. Under the direction of Mr. Massie, the burgh engineer, the old sewers, which varied greatly in diameter, are being reconstructed at a cost of £7,000.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English.....	6 10 0 "	6 12 0
Wrought-Iron Girder Plates.....	7 0 0 "	7 5 0
Bar Iron, good Staffs.....	8 5 0 "	8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0 "	20 0 0
Do., Welsh.....	5 15 0 "	5 17 8
Boiler Plates, Iron—		
South Staffs.....	8 15 0 "	8 15 0
Best Sneydhill.....	9 10 0 "	9 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £7 7s. 6d.
 Builders' Hoop Iron, galvanised, £12 to £13 per ton.

	Na. 18 to 20.	Na. 22 to 24.
6ft. to 8ft. long, inclusive	Per ton.	Per ton.
gauge.....	£11 15 0	£12 0 0
Best ditto.....	12 5 0	12 10 0
Cast-Iron Columns.....	£6 10 0 to	£8 10 0
Cast-Iron Stanchions.....	6 10 0 "	8 10 0
Rolled-Iron Fencing Wire.....	8 0 0 "	8 5 0
Rolled-Steel Fencing Wire.....	6 5 0 "	6 10 0
Galvanised.....	7 15 0 "	8 0 0
Cast-Iron Sash Weights.....	4 12 8 "	4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0 "	9 5 0
Cut Floor Brads.....	9 0 0 "	9 0 0

Wire Nails (Points de Paris)—

	6 to 7	8	9	10	11	12	13	14	15	B.W.G.
8/-	8.6	9/-	9/6	9.9	10.8	11.3	12/-	13/-	per cwt.	

	£5 15 0 to	£8 0 0
3in. diameter.....	5 12 6	5 17 6
4in. to 6in.....	5 7 6	5 10 0
7in. to 24in. (all sizes).....	5 7 6	5 10 0

[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

	Per ton.
Pig Iron—	
Cold Blast, Lillieshall.....	105s. 0d. to 112s. 8d.
Hot Blast, ditto.....	85s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.) :—

	67½ p.c.
Gas-Tubes.....	52½ "
Water-Tubes.....	52½ "
Steam-Tubes.....	52½ "
Galvanised Gas-Tubes.....	50 "
Galvanised Water-Tubes.....	50 "
Galvanised Steam-Tubes.....	45 "

	10cwt. casks.	5cwt. casks.
	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0 to	£24 10 0
Do., Vieille Montagne.....	26 5 0 "	28 15 0
Sheet Lead, 3lb. and upwards.....	13 12 6 "	13 12 6
Lead Water Pipe (F.O.R. Lond.).....	14 2 6 "	14 2 6
Lead Barrel Pipe.....	15 2 6 "	15 2 6
Lead Pipe, Tinned inside.....	16 2 6 "	16 2 6
" and outside.....	17 12 6 "	17 12 6
Composition Gas-Pipe.....	16 2 6 "	16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6 "	16 2 6
Pig Lead, in cwt. pigs.....	10 16 3 "	10 17 6
Lead Shot, in 28lb. bags.....	15 0 0 "	15 5 0
Copper Sheets, sheathing and rods.....	71 0 0 "	71 5 0
Copper, British Cake and Ingot.....	59 5 0 "	59 15 0
Tin, Straits.....	116 2 6 "	116 12 6
Do., English Ingots.....	120 0 0 "	120 10 0
Spelter, Silesian.....	20 15 0 "	20 17 6

TIMBER.

	per load	£10 0 0 to	£18 0 0
Teak, Burmah.....	9 15 0 "	16 0 0	
" Bangkok.....	9 15 0 "	16 0 0	
Quebec Pine, yellow.....	3 7 6 "	7 10 0	
" Oak.....	4 10 0 "	10 0 0	
" Birch.....	4 0 0 "	9 0 0	
" Elm.....	4 10 0 "	8 0 0	
" Ash.....	4 10 0 "	6 10 0	
Danitic and Memel Oak.....	2 10 0 "	5 10 0	
Fir.....	2 7 6 "	5 5 0	
Wainscot, Niga p. log.....	2 7 6 "	6 0 0	
Lath, Danitic, p.f.....	4 4 0 "	6 0 0	
St. Petersburg.....	7 15 0 "	8 0 0	
Greenheart.....	7 0 0 "	15 0 0	
Box.....	0 8 6 "	0 8 9	
Sequoia, U.S.A.....	per cube foot		
Mahogany, Cuba, per super foot			
lin. thick.....	0 0 8 "	0 0 8	
" Honduras.....	0 0 8 "	0 0 7½	
" Mexican.....	0 0 4 "	0 0 5½	
" African.....	0 0 3½ "	0 0 3½	
Cedar, Cuba.....	0 0 3½ "	0 0 3½	
" Honduras.....	0 0 3½ "	0 1 3	
Satinwood.....	0 0 3 "	0 0 7½	
Walnut, Italian.....	0 0 3 "	0 3 1	
" American (logs).....	0 8 1 "	0 3 1	
Deals, per St. Petersburg Standard, 120—12ft. by 1½in.			
by 1½in. :—			
Quebec, Pine, 1st.....	£22 0 0 to	£29 5 0	
2nd.....	18 5 0 "	23 10 0	
3rd.....	11 15 0 "	14 0 0	
Canada Spruce, 1st.....	11 15 0 "	15 5 0	
2nd and 3rd.....	8 15 0 "	10 5 0	
New Brunswick.....	8 5 0 "	9 15 0	
Riga.....	7 10 0 "	8 5 0	
St. Petersburg.....	8 10 0 "	16 10 0	
Swedish.....	11 10 0 "	19 10 0	
Finland.....	9 0 0 "	10 5 0	
White Sea.....	12 0 0 "	19 10 0	
Battens, all sorts.....	6 10 0 "	14 15 0	
Flooring Boards, per square of 1½in. :—			
1st prepared.....	£0 13 0 to	£0 19 0	
2nd ditto.....	0 12 0 "	0 16 0	
Other qualities.....	0 5 9 "	0 14 0	
Staves, per standard M :—			
U.S. pipe.....	£37 10 0 "	£45 0 0	
Memel, cr. pipe.....	220 0 0 "	230 0 0	
Memel, black.....	190 0 0 "	200 0 0	

STONE.

Darley Dale, in blocks.....	per foot cube	£0 2 3
Red Mansfield ditto.....	" "	0 2 4½
Hard York ditto.....	" "	0 2 10
Ditto ditto 6in. sawn both sides, landings, random sizes.....	per foot sup.	0 2 8
Ditto ditto 3in. slabs sawn two sides, random sizes.....	" "	0 1 8

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations.....	per foot cube	£0 1 0
Delivered on road waggons, Paddington Depot.....	" "	0 1 6½
Ditto ditto Nine Elms Depot.....	" "	0 1 8½

Portland Stone, in random blocks of 20ft. average :—

	Brown Whit Bed.	White Base Bed.
Delivered to railway depot at the quarry.....	per foot cube	£0 1 5½ to £0 1 7½
Delivered on road waggons at Paddington Depot.....	" "	0 2 1 to 0 2 2½
Ditto Nine Elms Depot.....	" "	0 2 1 to 0 2 2½
Ditto Pimlico Wharf.....	" "	0 2 1 to 0 2 2½

OILS.

Linseed	per tun	£17 15 0	to	£18 15 0	0
Rapeseed, English pale ...	"	23 10 0	"	23 15 0	0
Do., brown	"	22 5 0	"	22 10 0	0
Cottonseed, refined	"	19 10 0	"	21 5 0	0
Olive, Spanish	"	32 0 0	"	32 0 0	0
Seal, pale	"	28 0 0	"	30 0 0	0
Cocoonut, Cochiti.....	"	30 0 0	"	31 0 0	0
Do., Ceylon	"	24 10 0	"	25 0 0	0
Palm, Lagos	"	28 0 0	"	28 10 0	0
Oleins	"	17 5 0	"	19 5 0	0
Lubricating U.S.	per gal.	0 7 0	"	0 8 6	0
Petroleum, refined	"	0 0 5½	"	0 0 0	0
Tar, Stockholm.....	per barrel	1 8 0	"	1 8 0	0
Do., Archangel.....	"	8 19 6	"	1 0 0	0
Turpentine, American	per tun	87 0 0	"	87 5 0	0

CHIPS.

Among the medals presented by the Council of the Society of Arts for papers of exceptional value read during the session is one to Mr. G. F. Bodley, R.A., F.R.I.B.A., for his lecture on "Some Principles that may be Guides for the Applied Arts."

The new waterworks at Minster-in-Sheppey, just constructed for the Sheppey Water Company, were formally inaugurated on Thursday in last week.

The Art Gallery Committee of the Rochdale Corporation have accepted the gift from Mr. R. Taylor Heape of eight valuable pictures, as additions to their permanent collection. Two are by F. Goodall, R.A., and the other six are works by R. Ansdell, R.A., Sir P. Burne Jones, J. C. Dollman, J. D. Harding, David Roberts, R.A., and James Sant, R.A.

The Leeds City Council have decided to proceed with the application for the extension of the city boundaries by the inclusion of a number of suburban areas totalling 15,000 acres.

The education committee for Norwich have appointed Mr. C. J. Brown, the architect to the Dean and Chapter of that city, as their architect at a salary of £200 a year, to include all general work executed at a less cost than £1,000, above which sum a special arrangement will be made.

The sales at the Mart last week (including the Kensington Estate sale at Winchester House), as registered at the Estate Exchange, amounted to £267,036, and for the corresponding week of last year to £149,884.

An arbitration was recently held by Mr. Daniel Watney as to the price to be paid by the urban district council of Uckfield for land at Crowborough, belonging to the Marquis of Abergavenny, and required for sewerage purposes. The award has just been published, and amounts to £3,600.

The War Office are about to invite tenders for the erection of a new block of buildings at the Royal Military College, Sandhurst, to provide accommodation for an additional 300 gentlemen cadets. The present college has room for 350 or 360 cadets. It has also been decided to erect apart from the college a block of married quarters for the families of the non-commissioned officers. A block of officers' quarters is also to be built, and for all these works a sum of £365,000 has been voted. It is hoped to commence operations in the early part of next year.

The town council of Southampton have adopted plans and estimates by the borough surveyor for another pavilion to be added to the isolation hospital at an estimated cost of £5,200.

Dawbury Joint Hospital Board have decided to apply to the Public Works Loan Commissioners to borrow £4,000 to complete the new hospital at Earlsheaton.

The Duchess of Albany will unveil the Surrey County memorial to Queen Victoria, at the County-hall, Kingston-on-Thames, on Friday, December 11, at 2.30. The memorial consists of a terracotta statue of the late Queen, showing her as she was at the time of her Coronation, seated in the Coronation chair in her Coronation robes, and holding the sceptre in her hand.

The London County Council have just had erected at the cemetery at New Southgate a massive memorial to the memory of the 51 patients who lost their lives at the fire at Colney Hatch Asylum on the 27th January last. It is a granite runic cross on die and plinth, the front of the shaft and wheel being decorated with carved interlaced work of Runic type. Next to the inscription is an enlarged model of the London County Council official seal in solid gunmetal. The whole is in grey Aberdeen granite.

Professor Henry Louis, of Newcastle, who was sent out by the Government to investigate the asphalt deposits at Trinidad, addressed a meeting on the subject on Monday night at Newcastle-on-Tyne. It had been suggested that the so-called pitch lake from which 120,000 tons of asphalt were dug annually was inexhaustible, but Professor Louis said he had been able to prove that this was not so. The level of the lake had sunk to a degree corresponding exactly with the quantity taken from it. If they knew the depth of the lake they would know to a ton how much asphalt was in it.

The Barrow-in-Furness Corporation is promoting a Bill in Parliament for powers, amongst other things, to build a bridge across Walney Channel, at an estimated cost of £124,000. The Bill also seeks powers to construct several tramways within the borough and a tramway across the proposed bridge.

On Sunday a stained-glass memorial window was unveiled in St. Aidan's Church, Bamburgh. The subjects of the window are Faith and Charity, with St. Cecilia in the small triangular pane, the work of Messrs. Bacon Brothers, London.

Mr. E. T. Price, who has been for the past five years the clerk of works at Truro Cathedral, representing Mr. F. L. Pearson, the architect, during the building of the nave and central tower, is about to leave for Johannesburg, where he will superintend the building of a parish church and hall of St. Mary, the architect being Mr. G. H. Fellowes Prynne, of London. Last week Mr. Price was publicly presented at Truro by the ex-Mayor in the name of the subscribers with an illuminated address and a purse of twenty guineas as an appreciation of his work at the cathedral, and public services in other ways, including the chairmanship of decoration committees. A second presentation was made to Mr. Price on Tuesday, when the Bishop, Dr. Gott, in the name of the Cathedral Committee, presented him with an illuminated address and a cheque for £50.

At the London Consistory Court, on Thursday in last week, Dr. Tristram, K.C., granted a faculty, as prayed for by the vicar and churchwardens of St. John the Baptist, Greenhill, Harrow, for pulling down the present church and rebuilding it on a larger scale, so as to provide increased accommodation, the population of the parish having been largely augmented since the church was built. The present church was erected in 1866, and seats 470; the fabric shows signs of settlement, and is shored up in five places. It is proposed to rebuild the church in three sections, and when reconstructed it will afford room for 890 persons. The cost of the work will be about £18,000. Subscriptions amounting to about £7,000 have already been promised.

The 15th-century church of SS. Probus and Grace, at Probus, Cornwall, is about to be enlarged at the cost of Mrs. Hawkins, the chief landowner in the parish. The south aisle is to be extended, and a vestry and organ chamber will also be added on that side of the church. The north chancel aisle will be fitted up as a morning chapel. Oak screens will be provided in aisles and chancel, and the east window of the chancel will be filled with stained glass.

Major - General Baden - Powell unveiled on Sunday, in the church of St. Martin's-in-the-Fields, a bronze tablet to the memory of the officers and men of the 18th, 21st, and 23rd battalions (sharpshooters) Imperial Yeomanry who died in South Africa during the war.

A memorial screen and tablet erected in the Warrington parish church by the officers, non-commissioned officers, and men, past and present, of the 3rd Battalion South Lancashire Regiment, to the memory of their comrades who lost their lives in the South African war, were unveiled on Saturday. The screen (Late Perpendicular in style) is of English oak throughout, and is divided into seven bays. Crowning the central canopy is the figure of an angel representing "Victory," carrying in the right hand an uplifted sword, and in the left a wreath of bay.

The Bath Corporation Waterworks Committee interviewed on Friday selected candidates for the post of waterworks engineer, at a salary of £350. Mr. J. Dent Young, engineer to the Bath and District High Level Waterworks Company, and Mr. N. J. Peters, Cardiff, were successful at the first ballot, and on a second ballot the voting was equal, and the chairman gave a casting vote in favour of Mr. Young, who was for six months acting engineer to the Bath Corporation.

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PROFESSIONAL QUESTIONS.

MANY and conflicting interests affect the profession of architecture at the present day. What with the questions of architectural education, statutory registration, competition reform, assessors, ancient lights, conditions of contract, and other subjects referred to by the presidents of the architectural societies in their inaugural addresses, the architect has enough to engross all his spare moments; for he must, to a certain extent, keep pace with these movements that are always going on outside his own special sphere. Nothing of the kind ever interrupted the calm tenour of the life of the architect of a previous generation. There were no such needs for restricting the entrance to the profession by examinations or registrations, few troubles about competitions; owners could build when and how they liked, without troubling about building by-laws, the law of ancient lights, and other regulations imposed by authorities of the present day. With, perhaps, the two exceptions of sanitary and fire-resisting construction, our forefathers were not much the worse off; their buildings were substantial and comely in appearance, there were fewer men in the profession, so that the evils of competition were not felt; and although there were no facilities for professional education such as we now possess, the architects of half a century ago were often competent and able men. But they worked in limited spheres, and building was comparatively simple. And the trades employed in building were equally competent; the apprentice system was in vogue, there was no undercutting nor overlapping of the trades, and the temptations to the "ca'canny" and "go easy" methods of labour we lately noticed did not prevail. Several reasons exist for the change in the building trades;—they have become more numerous; but, despite our progress, we cannot supersede the principles of honest labour. One writer some time ago attributed the present incompetence rife in the building trades not so much to the labour as to the supervision. "Incompetent foremen and estimators, clerical routine instead of practical execution, a smattering of technical knowledge instead of experience—these are the evils of the trade, and, coupled with trading on borrowed capital, or working the jobs on the strength of the 'draws,' constitute the real crisis." How many real builders apprenticed to the trades as a whole are now found? There is much justice in the indictment; the whole machinery of building is changed, the division of labour, mechanical routine, machine work, and over-supervision have taken away all individual effort and interest in workmanship. These are facts which lie at the root of the question. The experience of age and the natural gifts of a man are no longer taken into account by the "big" firm of builders. The "too old at fifty" idea is another prejudice of the large firm; the experienced workman is superseded by young, but inefficient, men. We are living in an age of specialism, the natural outcome of divided labour and contracting on a large scale; and this is a question of importance which deeply concerns the profession. Already we have specialists in certain branches of building, men who confine themselves to hospitals, and schools, workhouses, baths, labourers' dwellings, and technical institutes, and there is a likelihood that this tendency to split up the pro-

fession into branches will continue. It is partly the result of enlargement of the architect's field. A century ago the architect practised in a few well-defined branches; now they have multiplied indefinitely. All these changes have considerably helped to destroy the cohesion of the older system, and to add immensely to the labour of the profession. The architect must now ask himself, on entering the ranks, "To which branch of practice should I belong? Is it wise to practise in all the branches—in other words, to become a general practitioner?" These and other questions ought to be asked before the young architect has finished his studies. We are afraid the keen competition among the younger members is a strong inducement to them to accept any class of work which is thrown in their way, and that it is a long time before the architect can afford to pick and choose work. In the present very varied practice of a general practitioner, it is hardly possible to master the types and details of every kind of building, and the consequence is a rather superficial acquaintance with certain structures. On the other hand, by confining one's attention to one class of architecture, the architect is able to grasp the principles of plan, and to devote his attention to its many details. No doubt there is a disadvantage. The specialist is generally strong in plan, the plant, and details and fittings, and is apt to pay less attention to external design, and in some cases he relegates the latter part to an expert in draughtsmanship, with doubtful results. The elevations do not express the architect's meaning, or they are extravagant and devoid of character for the particular building. Modern architecture suffers a great deal from this subdivision of the art—plan by one, mechanical equipment and details by another, and the external elevation by a third. The trades are also conflicting, and their harmonious union is sacrificed. And this is one of the vital difficulties which the profession have to face. How are they to bring themselves again in touch with the crafts and trades connected with building, where, as we have seen, these have all become independent, either under the control of a contractor or as expert tradesmen on their own account. One in the trade recently wrote: "Except for the use of scaffolding and hoisting of machinery, is there any job which could not be worked by a manager for the architect and client as effectively as a manager or foreman now does it for a builder? With a reliable man and a depot for the hiring of scaffolding, &c., and the working of stone by stone firms, and joinery by joinery firms, the real practical builder could be on the works, the staff regulated by the size of the job. The architect would then be in touch with his work without the intermediary either as a capitalist or a clerk of the works." For a long period the big contracting firm has been an influence, and the practical builder and craftsman have had to take a secondary place; under the modern régime of specialism, we may again find it possible to make our builders and craftsmen responsible men working in their own interest.

Professional education must, of course, be influenced by the condition of building and the trades; by the demand for specialism, technical knowledge, and the like. These have made a higher standard of knowledge necessary for an acquaintance with manufactures and processes and scientific principles and details, which have been introduced during the last thirty or forty years. An architect must now master a good many more trades and details of a scientific, sanitary, and industrial kind than were required of him in the first part of the last century. The materials of building are more numerous. Take even the natural products of foreign and Australian timber, to say nothing of building stones.

Appliances and mechanical plants have multiplied, and these have all to be understood and applied. The old practitioner never troubled himself about floors and roofs or partitions that could withstand fire; the modern is beset with a host of patented systems. Such a thing as reinforced concrete, in which steel rods or "expanded metal" is embedded in the body of concrete, was not contemplated. The deductions of physics, chemistry, electricity all come within the modern architect's sphere, and are applied to many problems of construction. All these subjects have widened considerably the range of the architect's knowledge outside the art. Questions about acoustics, steel cantilever and dome construction; about the behaviour of metal under heavy loads, heat, corrosion; the chemical value of paints and varnishes, and modes of treating iron, stone, and wood are constantly cropping up. The architect has to be constantly ready to consider questions relating to heating and ventilating arrangements, and to be able to advise as to the best system; to understand the application of electric power in buildings, lighting—subjects which were quite outside the sphere of the profession not many years ago. Although there are specialists who undertake these matters, the architect is the first one consulted, and his opinion on the desirability of a certain system ought to be based on correct views and a knowledge of general principles.

There are professional questions as to which the architect has now to make up his mind. One of these is the subject of competition. As our readers are aware, there has been much controversy about the system; a great deal of dissatisfaction about the modes of invitation, inadequate instructions, unfair decisions, and so on. The professional man of to-day ought to be able to decide for himself whether a certain competition is a fair one or not for him to take part in. The conditions issued ought to be able to afford him evidence of the fact. The selection of a design may not be a good or honest one; but that is not the point. The question is, Are the terms of the competition above board, and such that a professional man may accept them? It ought to be evident on the face of the instructions whether they are so or not. The matter is one for the profession themselves to consider. Unfortunately, it is quite true that many architects are found to enter into competitions which are obviously unfair, in which the conditions are scandalously dishonest to the profession, or the premiums are an insult. Such conduct on the part of some of the profession is discreditable to the body as a whole, and lowers considerably the public regard for it. The recent action of the Abergavenny School Board in advertising for an architect, and requesting candidates to state their terms, and the response, is a degrading instance. A Competition Reform Society, for the purpose of promoting reforms and improved conditions, has been established, and has done, we believe, useful work in "blacklisting" competitions or in suggesting conditions more satisfactory, or in revising them; but we are afraid that there are men in the profession who are willing to respond to invitations on any terms, and so long as this anomalous state prevails, promoters of competitions will remain obdurate. As the President of the Society of Architects said the other day, such a practice required to be dealt with with a firm hand. Architects ought to be restrained from committing themselves to terms which no respectable profession would tolerate; but this restraint can only be learned by educating the members to a true sense of their vocation and responsibility. A statutory authority, as Mr. Thomas said, could control the profession, and it would do so by inculcating the value of professional conduct and making it a condition of qualification to practise; and it may well be asked why it was left to new societies to take these matters up. The architect ought to be

able himself to discriminate between reasonable and unreasonable conditions; but the truth is, the profession wants guidance and co-operation in these matters. Architects have not all the intellectual and moral force required; there is a want of social cohesion in their ranks which terribly weakens their power of resistance, as it does in those of lower social position. We have heard a good deal about the appointment of an assessor to act as joint architect, as in the recent Liverpool Cathedral competition—a principle certainly open to objection, except, perhaps, in that very exceptional instance. It is a question at least for the professional societies to consider to prevent its recurrence, and we are glad to see Mr. Woodward has brought up this question, which was discussed at the Institute last Monday. Many legal principles have now to be mastered. The conditions of contract is one of them—quite a modern necessity. The practical architect is required to be conversant with points of law; it is not enough that a lawyer draws up the contract between the parties. He at least is expected to bring his knowledge of the subject to bear; he has to instruct the solicitor as to what are reasonable provisions. In the majority of instances now the architect dispenses with legal assistance, and he draws up a contract according to the form that the R.I.B.A. has issued. For large buildings the form arrived at between the Institute and the Institute of Builders furnishes a good model to follow, with slight modifications where necessary. But there are not many in the profession who can frame a contract which will give satisfaction to building owner, contractor, and architect. The disputable questions which turn on such terms as the "reasonable satisfaction" of the architect or in respect of drawings and details afterwards supplied, as to the "true intent and meaning of the drawings and specifications taken together," as to "variations and extras," as to clauses relating to "defects," of the completion, suspension of works, extension of time, certificates, and especially as to arbitration, can only be mastered by a general knowledge of the law, and the decisions that have been given on these points. Another important question concerns Ancient Lights. We have lately given the gist of the Bill drafted by the joint committee of the R.I.B.A. and the Surveyors' Institution, and drawn some inferences with regard to it: but from the opinions we have heard expressed thereon the Bill has not given complete satisfaction. There are several interests concerned, chiefly the building owner, whether dominant or servient, the professions engaged, the lawyer, surveyor, and the public. These have all to be considered. The proposed measure will no doubt simplify the procedure, the lawyer will have less to do with the matter, the servient owner's interests will be guarded; it will not be possible, as it is now, to find one's light obscured by the erection of a new building without adequate notice and without means of redress; the position of windows and amount of light received will be recorded for the benefit of both parties, who will have access to the drawings; and the building owner will no longer be subjected to vexatious proceedings and the delay of building operations. These are decided gains. On the other hand, building operations will in many cases be prevented by the requirements, for there will be less uncertainty in the law, which have made it possible for building owners to try their luck, hoping by some legal point to escape the consequences. The action to be taken by the profession in certain cases of building and street improvements, such as that relating to the Strand and its northern line of frontage, in fixing upon sites for buildings of a detrimental kind in populous residential neighbourhoods, in the great housing question, and on other various matters about which the architectural profession as a body should have a voice, are questions that ought to be

discussed and agreed upon, instead of being left to individual opinion. Questions of taste are not so easily solved as those which relate to professional practice and conduct, or to public matters, or where the interests are so varied; but these all form part of the present-day equipment of the profession.

HOMESTEAD DESIGN.

THE architectural planning and construction of farm buildings is not, perhaps, a very attractive subject to the profession, as they generally associate the design of such buildings with the duties of surveyors of landed estates, and with experts who have made the subject their own. For some reason, the modern homestead is not a class of structure to appeal to our artistic sense; it is so essentially utilitarian that any attempt to make it architectural appears to be wasted labour. Why it should be so we cannot say, for as a matter of fact the old English homestead was often an interesting group of buildings which added immensely to the scenery of many of our country districts. The landscape painter loves to depict the old farmhouse and yard with its rural surroundings, and there is many an old barn to be seen in the Southern, Eastern, and Midland counties which has an architectural character essentially its own.

Mr. H. M. Cautley's paper on this subject, given at the Architectural Association last week, dealt chiefly with the practical side of the subject as it developed itself in the Eastern Counties. The type of buildings and fittings were of the simplest and most economical kind. The main essentials of farm buildings were sketched: as a good water supply (which our grandfathers provided by grouping all the buildings about a pond), a good metalled road close to the buildings, so as to avoid the expense of maintaining private roads—a serious yearly item. On arable land the buildings should be in the centre, or nearly so, as to save carting, and if the land slopes they should be placed on the slope to save uphill carting; but in dairy farms the buildings are better placed near the centre of pasturage, so as to save labour in driving and feeding the cows. As for aspect, "south with a touch of east" is the best for stock; when the homestead is on a slope, the buildings are best across the slope, to avoid steps. Other essentials are economy of construction and maintenance by the most labour-saving means; the most sanitary housing for livestock. Mr. Cautley does not give an ideal plan of a homestead; he rather naïvely distrusts the "model" farm building, which is often full of defects; but he thinks such a plan "will be found somewhere between the two extremes presented by the old-fashioned and modern or 'model' homestead." The advantages of both the ancient and modern plans are pointed out, and are worth quoting here. "In the old homestead there will generally be a large, rambling old barn of flail-threshing memory, with, perhaps, the cowsheds arranged about the same; the stables will be an entirely separate block, the piggeries in another, the granary, chaff-cutting house, and cartshed in another, and various outlying loose boxes and small cartsheds wherever there is an odd corner. In addition to this, the yards are nearly always of a much too large a size, rain-washed and wasteful of litter, all tending to the making of bad manure, whilst the aspect was rarely studied at all." The description is on the whole correct, though many of the old homesteads we know show that their builders were at least regardful of the latter point, and of the sheltering of their live stock. The conditions of the ancient mode of farming were so very different to the modern labour-saving plan, that we cannot rightly compare the plans on the same principles. Turning to the modern type, the

author justly observes, "All the buildings, even down to the fowlhouse, are grouped in one large parallelogram, the outside walls of which rise square and gaunt, with scarcely an opening to be seen." The author does not urge its ugliness, though he says that it is "the outcome of one of its most practical defects—viz., that everything is approached from within, frequently from internal roads and alleyways. Were it situated on some of our bleakest wold lands, I should find excuse in the pitiless winds and rains which drive across them; but why when on some sheltered hillside or sunny valley?" The plan does not save the roadways, it is urged. The few openings are distributed on all sides, and must have approaches, so the system is wasteful of cartways; nor does the author believe the modern grouped building is so economical, while the internal alley-ways require independent walls, and therefore do not save walling, and in case of fire the whole range is endangered. These, it must be confessed, are serious defects of the one large parallelogram plan. And the author points out, the deposit of manure in the small yard would be injurious to the health of the stock. Mr. Cautley said that in designing a homestead he would have as few internal approaches as possible; but that a common roadway should give access to every part; he would group the cowsheds, stockyards, and piggeries under the shelter of the barn and granary, keeping the horse yards, stables, and cartsheds distinct. The grouping of the sheds and stockyards would at least give a variety to the general composition that is so wanting in the "model" plans we have seen. While not following the rambling plans of the old homesteads, the architect, at least, can find opportunities for breaking his parallelogram instead of making the outer walls straight and bare. For instance, the cowsheds can be arranged to afford the best shelter or be placed against a barn, if the sheds are single lean-to's, for one row of cows. Several suggestions are given by the author on the details of planning a homestead, to which we refer the reader. In double byres or cowsheds the cows are perhaps most economically arranged head to head, with a centre feeding passage between; this allows the yards to be free for the disposal of the manure. The feeding passage must not be less than 3ft. wide, the manger will be 2ft. wide, the standing 6ft. 6in. from manger to edge of gutter. Describing other details, the author says each cow should have two bins, or four to each two-stall division, each holding a bushel, and the corner bin next division have a ventilating lid to hinge back—a plan which allows two feeds to be put in at the same time, and also permits of the cows being fed the first thing in the morning. The mangers should not be more than 1ft. 9in. in height and 11in. in depth, be made of 1½in. plank, the back plank being well canted. A support is required between the divisions. The remarks on the paving and gutters are reasonable; V-grooved bricks, with the grooves running in the direction of the fall are preferred, though a cheaper and efficient substitute is cement concrete finely faced. The sanitary authorities insist on open channels carried outside the shed, and the author proposes a stone slab rounded on the edge next the gutter. We quite agree with him that the standing for cows should be level in front of heelpost to manger, and should be of rammed clay or chalk. As to the question of open or covered yards, there is much to be said for the open arrangement; but modern farming and the use of cake foods have favoured covered yards, which prevent the waste of the manure by rain-washed yards, and the author allows 160ft. super. per animal, and good ventilation in the roof, which should be of a single span.

The old threshing barn was the central feature of the old homestead, but now super-

sed by the straw barn capable of holding about one day's threshing, and generally a two-storied building carried up the whole height, with 11 ft. high doors on both sides, that waggons may pass through the stockyards. Here the homestead architect may display a little honest art in making it a central feature, with stockyards sheltered by it on south side, and stackyard on the north, while its direction should be east and west. A floor of wood or the sawn-off butts of felled trees is perhaps the most desirable. The design of the straw barn should be simple, and honestly express its purpose. The high, large doors for waggons can be made a feature by gabling the sides, and the ends of barn, with the openings or doors high up for passing the threshed straw, can also be made to aid in the external effect. Next the food stores, the root store and mixing floor, with the preparing floors over for the crushing machine and chaff-cutting, form another tolerably high range of buildings which can be treated in connection with the barn. In these essentially utilitarian buildings it would seem that there is little opportunity for design; but a true sense of their fitness, accompanied by an artistic instinct, can turn them from uninteresting and ugly into plain but effective structures. Thus the doors of the root store and adjoining mixing floor must be necessarily large for carts to be backed in, and these openings can be treated with a little more emphasis than they usually receive. The tile roofs should have good eaves, and ventilators of a simple, inexpensive type should be used over the main sheds. Then there are the cartsheds, which may face north-east. Simple as these are, they add to the variety of the grouping. These should have openings not too high, about 8 ft., and about 9 ft. wide, so as to exclude the rain; and the proportion of these openings, together with the brick piers and wood posts and the tiled roofs, can be made to form useful boundaries of the yards and shelter them at the same time. The designer of such buildings must try to divest his mind of the hopelessness of making them agreeable; too often he dwells on their intractable, matter-of-fact nature, and arranges them according to a model, quite regardless of appearance, whereas if he had taken a little trouble in grouping the buildings, following as far as he could the old type of homestead, and using local materials in a manner to impart variety in design and colour, a far more agreeable result might be achieved.

In various volumes of the BUILDING NEWS we have given plans for farm buildings and dairy homesteads, based on modern experience, which may be taken as models of good planning; but there is room for improvement. The architect has not taken the problem into his earnest consideration. Generally his want of knowledge of agriculture, planning, and details of such buildings has deterred him from attempting to improve the "model" plan. The competitions for homestead designs have generally fallen into the hands of experts, and the selection of designs submitted has been invariably made by those who have a practical knowledge of the details of homestead planning and construction, but who possess little architectural skill. It does not follow that because a man knows little of stock or dairy farming or details he is unable to modify or rearrange a plan of such buildings, or to present them in a manner that is more artistic—presuming, of course, that he does not violate any principle of good homestead arrangement.

A new school was opened on Friday by the New Monkland School Board at Gain, near Gleubog. The school, which affords accommodation for 120 pupils, has been built to a design by Mr. John M. Arthur, architect, Airdrie, on a site immediately adjoining the old school, which it is proposed to take down.

ST. PAUL'S CHURCH JARROW-ON-TYNE DURHAM

TWO BENCH-ENDS FROM CHOIR SEATS

NOTE
THE CENTERING TO
TRACERY IS DESCRIBED
ON EQUILATERAL
TRIANGLES

SCALE OF FEET

12 INCHES

9

6

3

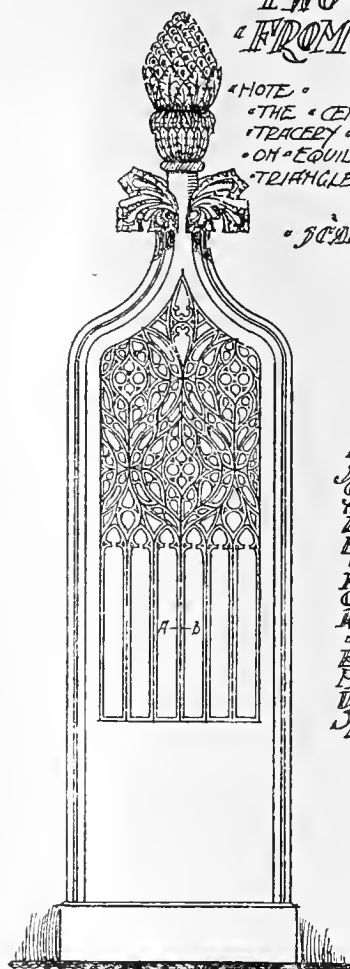
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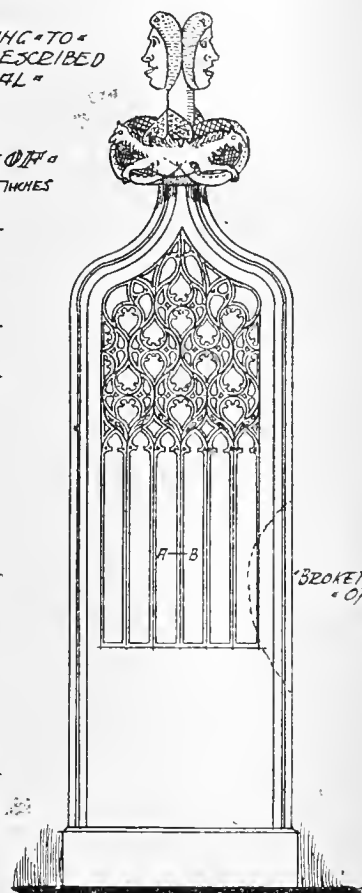
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FEET



ELEVATION



ELEVATION



SECTION OF END



SECTION OF TRACERY



SECTION OF WALL

MEASURED AND DRAWN BY
EDWARD RATHBY
SEPTEMBER 1903

SCALE FOR DETAILS

TWO BENCH-ENDS, ST. PAUL'S CHURCH, JARROW-ON-TYNE.

THESE two poppy-head seat standards, with their elaborate traceried ends, are from the choir seats of this church in Durham, and are drawn by Mr. Edward Cratney to scale, with sectional details of the mouldings. The work is in oak, and in good preservation.

THE RESTRICTIVE BUILDING CONDITIONS OF THE COUNTY COUNCIL.

AT the auction held in October last certain valuable building plots in the Strand, Kingsway, and Aldwych, on the Strand-to-Holborn thoroughfare, were offered on lease, but

no bids were made for them. In consequence of this fiasco, the Corporate Property Committee of the London County Council have been considering whether the building conditions relating to the leasing of the Council's surplus land acquired in connection with various improvement schemes should be modified with a view to the letting of the land more expeditiously. As the conditions stand at present, there is no provision made for arbitration. One of the conditions provides that in the event of any dispute arising between the Council and the lessee in connection with the erection of buildings, such dispute is to be settled by the Council's architect, whose decision should be final. The committee have now reported to the Council that they are of opinion that, although there were no bidders for the plots of

land in connection with the Holborn-to-Strand improvement at the last auction, the Council would not experience any difficulty in eventually disposing of the plots under the existing conditions. They were, however, impressed with the desirability of securing a speedy recoupment in connection with the improvement, and they thought the Council would be well advised to make some concession so as to facilitate the letting of the surplus land. They accordingly recommended:—"That the building conditions attached to the leasing of the Council's surplus lands in connection with improvement or other schemes be modified so as to include therein the following provision:—If, and so often as the same shall happen, any dispute shall arise after the plans and specifications have been approved between the Council and the lessee as to any matter connected with the erection of the said building or buildings, or the foundations or drainage thereof, or the preparation, laying out, fencing, or otherwise dealing with the said land, which matter is not provided for by 'the approved plans and specifications,' or any additions to, alterations in, or omissions from, the same authorised as aforesaid, or by these conditions or conditions of approval, every such dispute shall, if the parties do not agree, be decided by an arbitrator appointed by the president of the Royal Institute of British Architects, whose decision shall be final." This report was adopted by the Council on Tuesday.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS' BUSINESS MEETING.

LORD BALCARRES, Junior Lord of the Admiralty, and Lord Windsor, First Commissioner of Works, were elected Hon. Associates of the Royal Institute of British Architects on Monday last, when Messrs. Llewellyn Kitchen, Brook Taylor Kitchen (architect of the Local Government Board), Sydney Perks, Basil A. Slade, and Melville S. Ward were elected Fellows, and twenty-two gentlemen were elected Associates; Mr. Charles Follen M'Kim, President of the American Institute of Architects, being elected Hon. Corresponding Member. The results of the November Examinations were announced as follows:—146 students passed in the "preliminary"; 53 in the "intermediate"; and 22 in the "final" examinations. Five Probationers were exempted from examination, and were admitted as students.

LIVERPOOL CATHEDRAL COMPETITION.

The interest of the meeting centred in the two resolutions of which Mr. William Woodward had given notice in respect to the late competition for the new Cathedral at Liverpool, and, as might have been expected, the topic furnished material for an animated discussion, in which Messrs. A. W. S. Cross, H. T. Hare, Leonard Stokes, John Slater, E. T. Hall, T. E. Colcutt, Maurice B. Adams, John Woolfall (President of the Liverpool Society of Architects), S. Vachar, C. E. Hutchinson, E. W. Hudson, T. H. Watson, and others took part. The President, Mr. Aston Webb, with considerable tact and discrimination, kept the speakers to the points at issue, and went far to bring to an amicable conclusion what might otherwise have easily digressed beyond reasonable bounds. He alluded to the fact that so far as the appointment of the assessors in this case was concerned, the Institute was not consulted, so that in that sense the Council could not take any direct action in the matter, though he, personally, had not hesitated in his Presidential address to express an opinion as to the undesirability of a precedent being established in respect to an assessor consenting to act as joint architect with the author of a design chosen in a competition with which he had been so associated. The meeting was unanimous in supporting this view of such appointments, although it was explained that in this particular instance Mr. Bodley was told by the Committee unless he, and no other architect, agreed to co-operate with Mr. George G. Scott, the latter would not be employed to carry out his design. Therefore, to secure to him the result of his success, Mr. Bodley had, under great pressure, resolved to accept the position. Mr. Woodward, on this assurance, at once gracefully withdrew his resolution, which was as follows:—

"That this meeting views with the greatest disapproval the action of one of the assessors allowing himself to be associated with the selected competitor in the carrying out of the work."

In introducing this resolution and the one

which preceded it, Mr. Woodward manifested the utmost fairness, and carefully excluded all personal allusions other than those of an appreciative character in respect to the personality of both the assessors, Messrs. Norman Shaw and G. F. Bodley, and he warmly commended the skill and architectural merit displayed in Mr. Scott's design. The previous resolution was to this effect:—

"That this meeting condemns the action of the assessors in giving the first place in the final competition to a set of drawings which did not comply with the essential condition of the competition."

An epitome of the history of the competition was furnished by Mr. Woodward in bringing the question before the meeting, and he read extracts from the official conditions issued to the competitors in the final contest; but it appeared during the subsequent proceedings that that part of the instructions dealing with the provisional central preaching area to seat 3,000 in view of the pulpit was embodied under a suggestion on the part of the promoters, instead of being a precise condition or instruction, although it is quite clear that the committee had so intended such a central area to be provided, because on the receipt of the referee's award the committee rejected all the designs on the ground that Mr. Scott had not given such an area. This decision was reversed on the advisory architects explaining the error into which the committee had fallen, seeing that the question of a central area at the crossing of the building had virtually been left as an open question at the option of the competitors. Thereupon the committee decided to confirm the award, and Mr. G. G. Scott was approached as to his appointment being made conditional with the election of Mr. Bodley as consulting architect with him. Mr. Scott acquiesced without any reserve, as he explained in a letter addressed to the President and read by him at Monday's meeting. The following particulars, communicated to us by Mr. Bodley, and published in the *Building News* for July 24th last, give a confirmation of the correctness of this account of what happened:—

"When it was ascertained that the author of the selected design was Mr. Scott, a young man of twenty-two years of age with no practical experience of building, the committee naturally felt great hesitation in placing so important a work in his hands. They at first decided to abandon the result of the competition altogether; but, under the influence of strong representations from the assessors, they afterwards reconsidered this decision, and invited Mr. Bodley to act as joint architect with Mr. Scott. This Mr. Bodley at first declined, but expressed his willingness to become 'advisory' architect. The committee, however, would not agree to this suggestion, and it was plainly intimated that, unless he could see his way to taking the position of joint architect, Mr. Scott's design would be definitely abandoned. The situation thus created was a most difficult one, and in order to insure that substantial justice should be done, and that the competition, which had entailed so much thought and labour, should not prove abortive, Mr. Bodley finally agreed to the committee's wish, and became joint architect, a position which, however, he had neither sought nor desired. The publication of these facts will probably remove a good deal of misconception."

Mr. Woodward said he was cognisant of this letter, but that it did not convey to him the more definite reason which transpired during Monday's debate that the committee would not agree to appoint another architect to be associated with Mr. Scott instead of Mr. Bodley. The two resolutions were, in their subject matter, so intimately connected that it is not easy to separate their consideration in a descriptive report of the proceedings. In point of order they were taken separately in a business-like way, though necessarily the discussion overlapped. One definite issue was at any rate established, and in this the only practical result of the meeting may be said to consist—viz., that the members were unanimous in insisting upon assessors adhering more precisely to the plain interpretation of clear and definite conditions issued to competitors in all competitions than they have frequently hitherto done. It is folly to expect a loyal submission to the awards of referees, whether they are nominated by the Institute or not, if awards are made without a strict compliance with the rules of each particular competition, and also in agreement with the further instructions furnished by the questions of the competitors, and the official replies thereto. It is beyond question that of late instances directly in violation of such reasonable considerations have occurred, and we can hardly imagine anything more likely to bring the whole practice of architectural competition into disrepute than such conduct on the part of assessors, no matter how eminent they may happen to be in other respects. It will be useless for the Council of the Institute to expect compliance if such

irregularities are not dealt with as they deserve, without hesitation or personal considerations. The assessor cannot shield himself behind the dignity of his office by generalised assertions that no one who has not had the advantage of devoting as much time as he may have done, with all the drawings and papers before them, can form a proportionate opinion as to the merits of each particular instance. In the abstract this may be true, but in the cases present to many minds a very brief study of the premiated plans enabled a practised eye to discover manifest discrepancies which an assessor ought to have at once detected, while the competitors who had devoted as many weeks as the assessor has spent hours upon the problem in question realised no doubt whatever as to the injustice of premiating and selecting plans which fairly and squarely in matters of fact, and not on points to be determined by opinion, were at variance with the rules laid down. Sometimes assessors have been elected to judge in competitions for specialised buildings with which they have no personal acquaintance, and in others men are elected assessors who have themselves built nothing of the kind. No one doubts the difficulties which all assessors frequently have to deal with, and naturally there can be only one architect thoroughly satisfied with their awards—namely, the selected man; but the taunt that it is unsportsmanlike not to accept the fact of being beaten falls very short of the mark when the game itself is conducted in defiance of the rules, not only by competitors, but, above all, by the umpire. One of the speakers asserted that the whole of the Institute was in agreement with the conclusion as to the conditions of all competitions being rigidly adhered to; but in practice there has been too much laxity in this matter, so that if the debate leads to a more strict observance of this conclusion it will not have been in vain. Mr. Woodward's first resolution did not come to the vote, because an amendment was carried that the meeting proceed to the consideration of the second resolution. It may be interesting to add that the President of the Liverpool Society warmly supported the action of the Cathedral Committee, and explained that during the interval between the first competition, when Sir William Emerson's design was selected, and the last competition, almost all the original promoters and promised subscribers had died, and the site then contemplated had been lost. He approved of the course followed in the subsequent proceedings, though he added, "We all thought there were men in Lancashire equal to the task of being associated with Mr. Scott," and he mentioned Messrs. Austin and Paley. In respect to the statement in Mr. Woodward's first resolution as to the essential condition of the competition, by which he referred to the central preaching area, it is a notable fact that all the other designs did comply with this "suggestion," while three out of the five made it the governing factor in their plans, and two specially treated their particular arrangement of it with much architectural skill. We have only to add that while no one doubts the sincerity and integrity of Mr. Bodley, and while few would hesitate in saying that, under the circumstances, he did the best when he agreed to the proposal of the committee, it is none the less clear that the other competitors might have equally well succeeded if Mr. Bodley had been associated with them; and so the matter stands.

The various designs for Liverpool Cathedral were illustrated in the *Building News* for May 29 (when we gave the selected plan), June 5, 12, 19, 26, July 3, 10, 17, 24, 31, Aug. 7, 14, and 21.

SOME THOUGHTS ON ARCHITECTURAL DESIGN.*

OF architecture as an art I would speak. We may, for the nonce, pass over the many and varied aspects of our professional work that exacts all too much of our daily attention in the ever-taxing fields of everyday practice—aspects that loom large, too often, in the exigencies of many a narrowed sphere, and tend to obscure the larger hopes and onlooking towards the greatest and truest work of the architect. All great art is the same at its source of inspiration, and only uses technical methods for its proper and fit expression; the musician his instrument, the painter his brush, the orator his language,

* A paper read before the Royal Victorian Institute of Architects by ROBERT J. HADSON (F.), F.S.A.I.A., Architectural Lecturer, Working Men's College, Melbourne.

and the architect his pencil and his material. It is clear then, at a glance, that architectural design is not begun and ended upon paper, drawing being only a necessary means to an end—a way of expressing ideas that may be solidified in the building. So that drawing is necessary, and technical knowledge is more necessary, and clear and precise experience of the uses and limitation of available materials is necessary, and, coupled with them all, a clear and practical acquaintance with the capabilities of the local artificers who are to carry out the building work is necessary. And first, as to the source of true art. Where shall the architect seek for those powers that shall make him a master of architectural design? I would not set a limit to any man's field of education, for who can know the secret sources of another man's inspiration—of the powers and influences that have made him? True it is that no man is made in a day, and perhaps not in a generation, and even at the back of our investigating we are confronted (often against our will) with the dominant fact that the gods give to whom they will—some to be technical plodders, some to be mechanical constructors, and some to know the mystery of beauty and to express it in the solid stones. I can only give my own thoughts, and you can in the criticism, I hope, give yours to correct my errors. Let us then seek ever the inspiring power of Nature, and of the old architecture, for it is art we seek. It is popular to ask, "What is art?" and to expect that the answer could be given in a word as easily as the question. But art, like all great things, cannot be explained in a word. "What is truth?" is easy to ask from Pilate through all the ages; but who has answered the question? And "What is art?" is the questioning inquiry of aesthetic thinkers through all the years since our savage progenitors scratched their rude pictures upon the primitive rocks. But what is art? The tangible expression of an artistic idea. And who are artists? Those to whom the gift has been given of reducing to solid being and expression the ideal of beauty of form, colour, and sentiment that find their echo and appreciation in the minds and emotions of those who, in a degree, are like-minded. It is at the source we need educating—the development of the soul, the creative instinct, the vision-seeing Ego. For in so far as we are true to that, so is our work good, worthy of the appreciative thought of others, and worthy to remain. But when we yield to our banking account and the commercial spirit of the age, we fail. A man whose work is never greater than the regulation 5 per cent. upon the outlay will never be a great architect. I am aware that this is an uncommon way of giving "Thoughts upon Architectural Design," and your minds may revert to the old training course of drawing from the cast, studying the antique, measuring old work, office practice, knowledge of materials and construction, and skill in geometrical working drawings; yet you must be aware that a man may have all these things and yet not be a designer. Knowledge of a keyboard does not make a musician, nor knowledge of a colour-box an artist; and there is another thought that would appear at first sight to be a somewhat discouraging one to our students: we like to think that hard work and application will win all, but experience tells a somewhat different tale. The designer is more often than not born, not made. He holds the gifts of the gods. Develop that gift he must, or he fails; but when developed his one stroke will have more power than twenty strokes of the other man. And so it is of all the arts: the gods give to whom they will, which is a mystery we know not of. And secondly, as to the designers' outlook. We live as architects essentially in a commercial age, and to live must needs in a measure conform to the spirit of the age, lest we become obsolete and be carried away on the tide—the rushing, resistless tide—of popular demand, and be lost. We can, in a great measure, and we should, I think, be true to Art, and yet true to our own age. Architecture has fallen! And why? Because she has been too much the copier of dead forms that have had their day. Not for a moment would I think less of the classics, but we need not in our day the dead forms of dead men, but the living, vitalising expression of live men's ideas. The old designers were true to their own age—let us be true to ours. We copy the old work too much—no, not too much, we can never go over those lines of truth and beauty too often; but we linger too long—we stay when our own stroke should be made, too timid, too overawed by what we have seen to trust ourselves. It

would be presumptuous, we think. How can we hope to do anything but copy? But the man who fails after careful study to dare to put down his own line, however unsteady that line may be, is lost as a designer. Art needs the stroke of every true man's pencil, the courage of every individual's personal expression; and until she receives that our designs will be commonplace, dull, uninteresting, and merely the echoes of the thoughts of others applied to the problems of other days—needs that have in a great measure had their day and ceased to be. The design problems of our day are not the problems of the past, and no wise man will seek to answer to-day's questions with last century's practice, save that history and experience may help him to the better understanding of his task. Think for a moment of the difference of our architectural needs. Greek Art was perfect in its way, but its sphere was very narrow, and was limited by a one-story temple. Rome, with all her gigantic architectural and engineering works, had no need for the great office buildings, so vital a part of every modern city. And Medieval life, quaintly seen from the distance of time, produced the Baronial Castle Fortress, but little needed in these days of popular liberty. Religious architecture, of all the arts, clings most perhaps to its traditional past and ancient forms, and therefore can be the more used in the present, save that in the modern ritual there is more of preaching and less of ambulation, which would almost appear to demand the removal of the column in the body of the auditorium of modern church buildings. In this connection we should, however, remember that great design has in it many of the attributes of the gods common to all times, deep with a sense of fitness, and wide with a universality of beauty. And thirdly, as to the designers' actual work. A word should be said about style. As experience grows upon the mind, one is more inclined to pass aside those fixed ideas of working in one distinct style that fasten themselves so closely around the student mind as being the right and proper sphere of the designer. In this thought we break away from one of the very strongest traditions of our calling, and one that has doubtless led the profession into the danger of being the progenitor of dead forms—a profession without vital and progressive life. Some men follow a school, and find strength in banded numbers working upon similar lines—that is well. Others are strong in individual strength, and dare to be original, and that is better; they are the founders of schools. My plea is for each building to be considered purely upon its own merit, without bias or prejudice. In method of work I have seen the value of what may be called the "modelling mind." The "modelling mind" is not the perfecting of a plan or a series of plans of the intending building, but the gradual and altogether building-up of the design as a whole in the mind, and if you will, upon the paper. The clear working out of mass as to convenience, height, comparative position, elevation, skyline, construction, material, colour, and the rest. There is common belief that anyone can make a plan, but a designer is required for the elevation. Gentlemen, I take it a designer is required for the whole, and when a design is thus conceived one can no more take from or add to it than the artist painter can obliterate some part of his work upon the canvas without destroying the harmony and balance of the whole picture. While in this attitude of mind it is well to remember a few main principles:—Seek truth. Be true to your materials. Study mass. Let Nature do all she can with the exteriors with her sunlight and her shadows. Study colour and its harmonies. Know the un-failing value of a plain surface. If you ornament, know the value of clustered enrichments. Never be afraid of simplicity. Thread something through the whole, like one finds in great music and great painting—a touch of life that makes the whole akin. And when the design is completed, and properly and practically expressed by scale drawing and details, and explained by complete specifications, have tenacious belief in it, and swerve not from the definite purpose that it be carried out as shown. Nature is always teaching us something about *line*, and this of itself is a fascinating study that we may note in passing. There are lines that express all the various sentiments and emotions, such as dignity, solidarity, movement, true balance, aspiration, mystery, rest, and so on, and these the designer plays upon. In church design he needs very specially the vertical line, the clustered length of upright

pier, the mystery of narrowed interlacing traceries, and dimness of lofty roof, so charming in the Gothic. In the house design, the line of rest is best introduced—the horizontal line—the line we find in nature most often by the placid waters of broad rivers when the sun is low. Let repose prevail, and while seeking stateliness in the larger houses, and especially in those parts of the house more specially built for entertainment, see to it that in the living-rooms the level line be much seen. In public and semi-public buildings the play and effect of large dignified masses may be best seen aided by substantial materials. Our present-day Australian practice presents many peculiar and interesting difficulties. There is climate and available material—let us be true to both; and available funds as well, an all-important question, but one that is perhaps in very many cases made too much of a difficulty. To limit a man in price and materials in some degree is not, in my opinion, so great a disadvantage as some may suppose. No doctor declines a case because it is difficult; no lawyer worth the name refuses an opinion because his clients' interests are closely beset with difficulties; the greater the narrowing, the greater the skill required by the designer, that is all. With the finest of materials a poor designer will fail, and of that we see ample proof in every city, and ample in our own. One cannot say too often, "The well-designed building need not cost a penny more than the badly-designed one," and there is very ample need to lay firm hold upon this, for prejudice is intensely strong. And there are many other thoughts that crowd in upon the mind in a subject such as this; but there is now no time to dwell upon them. I know it is popular to be pessimistic about Architecture, to deplore the death of Art; but while the great mass of the work of to-day may be passed over with some regrets, there is reason to believe that the sacred flame of True Art has not been allowed to entirely die out. We know that the mountains are strewn with jagged rocks and barren stones, but the beautiful flower is there in the hidden crevasse. Gentlemen, let us seek it, cherish it, and work in hope.

BUILDING BY-LAWS REFORM ASSOCIATION.

At a meeting of the council of the above Association, at 45, Parliament-street, Sir Wm. Chance in the chair, the following resolutions were passed unanimously:—

1.—(A) That a By-Laws Committee, to consider and report on the amendments needed in the existing Building By-Laws be, and is hereby, appointed, consisting of the following Members:—Mr. W. M. Acworth, Lord Robert Cecil, Mr. A. H. Clough, Mr. A. Graham, Mr. W. H. Heman, Mr. Mark H. Judge, Mr. E. L. Lutyens, Mr. Arthur Newbold, Dr. G. V. Poore, Mr. H. A. Powell, Mr. Lacey Ridge, Mr. R. W. Schultz, Mr. J. St.-Lee Strachey, Mr. E. D. Till, Mr. Thackeray Turner, Mr. C. Turner, Mr. H. G. Willink, The Hon. Percy Wyndham, together with the Chairman and Honorary Secretary.

(B) That the Report of the Special Committee appointed on May 14 last, as adopted by the Council, be referred to the By-Laws Committee with a view to the work being continued on the lines therein laid down, especially as regards the following points:—

- (i.) For the purpose of securing, with as little delay as may be, some relief from the more oppressive of the By-Laws now in force in rural districts, the Committee to approach the Local Government Board and endeavour to secure their publishing a new set of Model By-Laws for these districts, embodying amendments which the Committee may suggest to the desired end. Further, to urge District Councils to amend existing By-Laws accordingly.
- (ii.) Following on the above, to prepare a set of Draft Building By-Laws carrying out the recommendations of the Special Committee that "the by-laws should lay down principles," and that "each by-law should provide that, unless the principle it enunciates is otherwise given effect to to the satisfaction of the local authority, it shall be considered to be given effect to if the requirements set out in the schedule to the by-law are complied with."
- (iii.) As soon as practicable, to deal with the by-laws of urban districts in like manner.

2. That the above resolution be forwarded to the members of the Association in a circular letter requesting them to inform the By-Laws Committee of any cases of hardship under existing by-laws, and asking them to make the Association known to their friends, in order that the number of members may be increased as much as possible before the annual meeting in February next.

On Saturday night a fire broke out at 7, Wormwood-street, City, a building of about seventeen rooms. The occupants were Messrs. R. Storey and Co., timber merchants, Mr. E. E. Niblett, architect and surveyor, and other firms. The building and its contents were seriously damaged, and the caretaker's wife lost her life.

A COMPARISON OF ENGLISH AND AMERICAN METHODS OF THE ERECTION OF BUILDINGS.*

By CHARLES HEATCOTE, Architect, Manchester.

I AM not dealing closely with the constructional designing of buildings, although that has considerable bearing upon our subject, but with the methods adopted by the erectors of the work. In the Press or elsewhere, only one superiority in building matters has been claimed by or for the Americans—the claim of speed. In the most picturesque of the Press comments no claim has been put forth for better work, better finish, less settlement of walls, less cost, or any other advantage over the English contractor than the one of acceleration of speed in the erection of the work. It is an important claim, however. Is it a just one? In my opinion it is, only qualified by the remark that, all other things being equal, it has been an exaggerated claim. What are the methods adopted by the Americans which are not in general vogue with English contractors, whereby this acceleration is obtained? Several factors are necessary, and in a parenthesis it may be added that there are many Englishmen possessing every one of them, who have worked with them in full play, achieving much, although, like Englishmen, they have done so quietly, quite oblivious of the fact that they were doing anything deserving special comment or in any way out of an ordinary, quick, bright, business life. But my point is that these speeding-up qualifications are not as widespread amongst us as with the Americans. Again cautioning you I am only referring generally and not individually, let me come to the "practical politics," and give you a summary of these

FACTORS OF SUCCESSFUL RATE AND PROGRESS.

The American is:—Firstly: More keen upon his work than we are. Of him it cannot be said, as of some Englishmen, that his business occupies his spare time. It is more true of him than of us that business comes first and pleasure afterwards. Secondly: The American architect is more generally alive to rapid completion of the drawings and details of the approved scheme in order to enable the contractor to know at the start virtually the whole of what he has to do. He also, if the work is such that it can be introduced, schemes his construction in such a manner that quick speed is attainable. Coupling-up steel stanchions tends to more rapid progress than endeavouring to provide polished granite from a Scotch quarry in winter. Thirdly: Based on being provided with the drawings, the contractor is enabled to perfectly organise his work. Every contractor here will know the extreme benefit and help this is to him, and would appreciate being always provided with early full settled information, clear and definite. Fourthly: This is one of the principal factors. Why should American architects work early and late, employing wider assistance to enable them rapidly to complete their drawings and instructions? Why should the American contractor spend much more on superintendence, on labour, on overtime, on earlier delivery of material? They do it because the American proprietor, more fully appreciative of the fact that the rapid building of his works means money to him, is willing to pay the necessary additional expense such services involve. It is a pecuniary advantage to him, and he does not hesitate to pay in order to gain it. By his paying for it the costs of the acceleration are met, and the incentive provided for the greater exertion on everyone's part. Fifthly: The American values more the power of work in his employes than the amount of minimum wage, and to save time will more eagerly seek the latest hoisting and other machinery. The attitude of the working man is also in his favour. An American workman seems to recognise that the more cheaply an article can be produced through economising labour the more the trade as a whole will be benefited, and, as a natural result, the labouring classes must be also. I have seen the matter put thus: "We know we are the gainers in the end if a new machine is introduced which does the work of ten men by the help of one. American employers always pay better wages to the men employed in their labour-saving machinery, and this has a tendency to advance wages all round, and find more and more employment." On the other hand, it seems to be the

deliberate policy of some trade unions in our country to compel their members to do as little work as will pass muster. This is a hard saying; but letters to this effect to the *Times* failed in getting any denial from the Union leaders. I should like to know this was a mistaken impression. It does not obtain, however, so much in the provinces at the present time. In this summary you have the whole matter. It is application and devotion to work, with profit as the incentive and reward. Let us deal with these

FACTORS IN GREATER DETAIL.

An American is keenly alive to the necessity of work, thought, and application in his business. He commences his business education early. The system of education of the youth of America is founded more with the object of the ultimate business-life than is ours. It is of more importance with him to know the history and to study the causes of American industrial progress than to be imbued with the knowledge of a dead language. He is in his early manhood being properly fitted for his career, and his interest is thus bent towards his business pursuit. He has every opportunity for being trained in the right direction. Technical education implies in teaching some concern for the practical prospects of those taught. Practical experience goes with the theoretical. An American, by a common-sense education, does not enter upon his trade with a suspicion that he is demeaning himself. Hopeful enterprise is the spirit in which he begins; he believes in the thing he has to do, and is proud of it. Can this be said to be the general drift of our higher educational systems at present? It must be remembered America is a huge new country, and for a century there have necessarily been continually new developments, widening industries to meet the needs of an increasing population still further enlarged by constant immigration, and consequent urgent demands in ordinary times for labour and material of every kind in building operations. These young industries were fostered by Protection. The price of the nation's manufactures and the wages of the people continually increased. The cost of home productions being thus generally enhanced, the absolute necessity arose for the seeking and adoption of every feasible method for the reduction of that cost if trade were to be increased at home, and still more if there were to be any weighty business in exporting manufactured articles to a country where Free Trade at any rate kept down their cost. Necessity was again the mother of invention. The natural outcome with an energetic people was the introduction of labour-saving machinery. For this competition labour-saving machinery was not the only thing needed, but improvement in the manufactured article where such could be obtained. The necessity found the incentive and motif, without which nothing important will be done. Similar results follow here where necessity has driven home the incentive. For the moment some of our trades have been overtaken, but in many all efforts have been in vain to exceed the excellence of our manufactures. Great Britain is still easily first in certain textiles and textile machinery. No other country can approach the productions of Lancashire and Yorkshire. Recent indiscriminate eulogies of almost everything foreign compared with our own work and methods have given a very erroneous impression. It has become the fashion to depreciate ourselves until people are beginning to believe it. An American, on the other hand, makes a point of praising his own country on every possible opportunity. We seem almost eager to belittle the industrial efforts of our island. We are unjust to ourselves. The products of our great Yorkshire mills are not equalled anywhere in quality and finish. Our carpets, our cotton, our cloth, the precision of our machinery, our shipbuilding, our pottery, our cutlery, are still unbeaten. Abroad our goods hold their own in quality and finish, although in some directions there is certainly great need for new ideas and improvements of design. When staying at one of the New York largest modern hotels, I was much struck with the beautiful finish of the bath and lavatory appointment and general plumbing work. Being naturally desirous of gathering information wherever possible, I asked for the name and address of the firm who did the work, intending whilst in America to visit their establishment to see their goods. The whole hotel, it turned out, had been fitted by a London firm. If this had been reversed every newspaper in England would

probably have contained an article upon American enterprise, with gushing accounts, possibly paid for, about the decadence of the sleepy English sanitary engineer before the young American invader. Gentlemen, in matters of self-advertising we are as Babes-in-the-Wood compared with our cousins. This method, at all events, is totally opposed alike to the sentiment of Englishmen and the better class of Americans.

INCENTIVE THE LEVER OF REAL PROGRESS.

It has not been very strong with us. The supremacy of our old country for many years in manufactures, industries, and wealth seems to have induced in us the habit of thought that we were by nature and a good providence the only possible first; that our very success indicated there could hardly be room for improvement; that what was good enough for our fathers and made their fortunes was good enough for us, who were doing very well, and there was no apparent need for strenuous endeavours for other methods, increased knowledge, and new markets. But for those wishing to compete with us, and to effectively attack our position, an opposite state of things obtained. Their necessity, circumstances, and environment have called forth increase of energy and application, whilst we have been in many ways generally content to remain as of old, having formed our habit of believing we were unassailable as the workshop of the world. But this is quickly changing. The working force does not appear to be a matter of race at all. A Britisher going to the States soon adopts the quicker actions of the country, and overcomes the conservatism of his old ways. The best brickwork, for instance, in New York has been done by English bricklayers. There is no one definite reason that can be given for this quickening of activity. The work is done under a different organisation, and follows methods of economising human labour. These combined, when acting in conjunction with exactly similar machinery to ours, produce a greater result. And the workman himself recognises this. Americans have some methods ahead of ours; but in other ways they have as much to learn from us as to teach. There is this great difference, as I have been endeavouring to show, the greater desire to learn, and to take advantage of what they see to effect improvements in their work and methods. They are, in a word, more keen to find out and adopt good new ideas, as they appreciate it is to their all-round advantage to do so. And if you find on one side a young man imbued with this spirit in his business, and on the other one who does his work more as drudgery, with an eye to leaving it behind at the first moment, which is likely to gain the business, other things being equal? Excessive railway and canal charges may have been in our island largely responsible for decline in some trades; but there have been causes of deeper significance. Have the sons and successors of the founders of many of our industries generally been actuated by the genius, pluck, and untiring energy of their fathers? The inducement was not there for the same old strenuous life.

We have everything in our favour if we will but overcome our old self-satisfied conservatism of thoughts and methods. The English quiet, self-respecting determination, coupled with keenness for quicker work and better organisation, is all we need. It is not entirely the highest speed that is wanted, but the old good workmanship, better speed and progress, well-organised methods. I was recently asking an Englishman, who had lived twelve years in Melbourne, his opinion of American competition there. He illustrated his answer by saying if one heard of a good prospecting locality and went to see it, one would be sure to find either a Scotchman or Englishman there already, pegging out claims; but if one went into an ironmonger's store, probably half the goods would be American, the remaining portion being English of the same pattern exactly as ten years ago, strong and durable as ever, whilst the American productions of the same class, not as strong and durable as the English make, but improved in style and pattern two or three times in the period. This illustration very clearly explains our respective positions. There is not the remotest claim that American buildings are better built than ours. Work rushed by flares and at night, for instance, cannot be as good as that accomplished by daylight. I am a believer also in the sober section of our working men and women, whose skill has no equal, and I very much doubt if in times of stress and difficulty their quiet, determined courage has, either

* Lecture given at the Society of Arts, London, December 1, 1903, to the Institute of Builders, Mr. William F. King presiding.

In some sections of industrial activity it will be very difficult to regain our former position, and it will only be accomplished by long, patient study and application. But it is not only this in many cases. I am thinking at the moment of the chemical industries. The German manufacturers are said to have succeeded in obtaining a wider grasp of this business than would have been possible if we had had the inclination and the foresight to have provided thorough training easily within reach. But our patent laws are answerable for a great deal of it. Every other nation but ours makes it conditional to work or license a patent if granted in their territory, but we allow a patent to be taken here without this. Although aniline dyes, for instance, were first made in England, the effect is that Germans patent their chemical improved methods in both countries, working it in their own country and stopping anybody doing it here. Surely such a law should be altered if we complain about bad trade. We are deliberately helping the foreigner in many cases against ourselves. There are scores of inventions made by Englishmen thus patented, and credited to other peoples by the action of these patent laws, and among them many connected with the building trade. This is my excuse for naming them. Even the most fiscally-upsetting Conservative or the most commercially-reposeful Radical could not object to freeing us from such prejudices as are contained in our present patent laws. There are more drones here than in the American hive. This is not very healthy if we are to retain our position. The only way to effect an improvement is to provide inducements. A young American will work and study in his business because he is assured of remunerative employment at the end of it, and the more he knows and the smarter he is the better he will be paid. That inducement does not hold good here to the same extent. If a man is a labourer he will not be allowed to lay bricks, however clever he may be at it, until he has served many years of apprenticeship. What inducement then has he to learn to lay bricks? Further, are our new magnificent technical schools filled with eager youth striving to extend their knowledge in the particular line of their calling? Many there are who industriously and commendably apply themselves to it, but there is not the eager, hearty entering-in of the great mass of the people, because the inducement is not there. Can the desire for knowledge of building construction in the average builder's clerk be compared to his anxiety for a football match?

THE POSITION AND WORK OF THE ARCHITECT.

The second factor mentioned was the great body of architects are greatly interested in their calling, and are keen in their business application, with great capacity for work. They possess, among other reasons, a strong inducement for the due fulfilment of their duties in the fact of the fascination and joy in the work itself. But we have not, as a body, sufficiently risen to the fact that a month saved in the preparation of drawings and data probably means a month's interest and a month's profit to our clients. We have not also as a body sufficiently educated ourselves in modern advance in those forms of construction and the use of materials leading to saving of time with its attendant advantages. It is not fair to a contractor ready with his plant, his office, his desire to please, to be hampered in his progress by want of drawings, which are his illustrated instructions, his directions. He is a wise architect who will learn that by saving time he is assisting his client and strengthening his own reputation. I am fully aware of the delicate ground I am now crossing. There are many men in my profession as much to the fore in all this as any American, but it is not the average; and in speaking of assisting the speed of execution, I am as fully aware as anyone that speed is not everything, that in some cases it is a distinct disadvantage in construction and stability, that there are circumstances in which it would be decidedly detrimental to the structure and averse to the interests of one's clients, and in other cases it would be impossible to build quickly, but as a body we do not furnish the contractors as quickly as we should with the drawings if we are expecting him to exercise all the skill he can in forwarding matters. I once knew an architect who obtained estimates for ten different designs for a dining-room dado before he could decide up his mind, and I have no doubt many in this room could give some amusing anecdotes of a like character. Further, we in England,

architects and builders, do not as fully fill the ranks of superintendents of the works as we advantageously might. We can most of us learn something here from the Americans. A clerk of works, capable, worthy man though he be, whether formerly a joiner or of any other trade, is considered generally to be doing his whole duty, which he probably is, by watching material as it arrives to see if equal to the contract requirements, by keeping data as to weather, number of men employed, &c. This, in any work above a small one, needs augmenting. By all means retain the clerk of works for these necessary duties, adding to them the keeping of progress plans, but in any more important work, another, and a more highly trained assistant, or half a dozen such, may be added. It is impossible to carry out a large work with expedition without the aid of plenty of superintendence. If there is much steel employed, a qualified engineer is needed at the steelworks to test the materials and to personally see that the proper rolling is done, and that the beams, stanchions, and work generally as first needed are being put together well in time for delivery before they are actually needed for placing in position. Capable men are needed on the building itself to supervise sections of the work, and personally see that the rate of progress is maintained; that whatever materials are needed in succession are on the spot. There must be a system of organisation, and each individual supervisor must know his position in it, and undertake that his individual section lacks nothing by want of foresight. These superintendents, under the control of the architect, must look forward in their work, and convince themselves all is ordered well ahead and to be in time. Organisation by a capable, practical head is needed—and the architect is the man appointed to be that head and director. On my own buildings I have "progress" plans, with the dates upon which certain parts of the work are expected to be completed, it being the duty of the superintendent of any one part to see that such instructions are carried out. He has a defined work to see to. In a building we have now on hand in the North, covering some $5\frac{1}{2}$ acres of land, this is done, and every part of the work mapped out. It is organisation. It saves time, and is methodical. This is what an American would also do. You probably do it also, but it is not universal. In one building we were doing there was a large amount of timber necessary, which we bought in America; and we had an inspector in our own pay at New Orleans to inspect the timber before being put on board, in order to insure proper material and despatch. An American would act similarly. There is in all new buildings a certain speed of erection which forms the most lucrative rate to the contractor. If, on the one hand, he gets too slow, the cost of erection is enhanced, and the same remark applies if he is excessive in speed. Consequently, if an architect (and the proprietor through him) asks for tenders for the execution of certain works, with the intention of placing the contract with the firm submitting the lowest prices, he can, in equity, only expect that rate of speed at which the contractor makes most profit, for that is all he tendered to do, and is all the proprietor is paying for. The great majority of contracts are let in this country on this understanding, for the date of completion which is named on the contract is calculated on this footing. Neither an American nor any other contractor tendering on this basis would spend his money on accelerated speed if he reaped no benefit thereby. This part of the matter resolves itself into a small compass. If a proprietor wishes a very quickly erected building he must pay the necessitated additional outlay enabling the contractor to effect it at a reasonable profit. Herein lies the germ of the whole matter, and herein comes the American greater keenness at once. We have not fully risen to the fact in connection with the great bulk of our contracts that if a proprietor saves £1,000 in interest on his land value by quickened construction, it is a very good business to spend £750 in order to obtain it. It is, of course, no new thing to us; but we have not as fully realised it as we should. An American proprietor not only does appreciate this, but he acts on it, and will spend more than the £1,000 actually saved in interest, because he makes money by having his works and premises as a going profit-making concern all the sooner. There are many in this country who see all this and act on it; but it is not general. Given the same rate of payment and the same conditions, an English contractor will work as quickly, as well,

as thoroughly, and as satisfactorily as an American, and better in some manners and ways, which we, in this island, prefer. I will presently give you an instance of this. In making a contract my sons and myself give a penalty for non-completion, with an exactly similar bonus for earlier termination. We find the result just as anticipated, and that we often have to certify for a substantial bonus. It gives us much pleasure when this occurs, for it is an extra payment due for diligent service, good business organisation, and a gain to both proprietors and contractor. If, however, a very speedy work is desired, bonuses are given the sub-contractors for the acceleration. If some imaginary buildings were worth £100,000 to erect in eighteen months, and the builder were offered £10,000, or £15,000 if completed in fifteen months, there would be a strong inducement to pay extra wages for a choice of good workmen and plenty of them, to find bonuses of 1s. 6d. per thousand for bricks for earlier delivery, to provide many a half-crown or five shillings to men to complete a certain thing by a given time, to pay £2,000 for early delivery of steel or stone, to put down the speediest machine, to berth additional superintendents to hustle things up. An American would take greater risks in addition, for they do not put scaffolding like you do in London. Herein, I reiterate, lies the germ of the whole matter: the readiness of the proprietor to pay for the extra speed or advantage.

WHAT ARE WE DOING IN ENGLAND?

Having thus dealt with the factors making for the American methods, let us now consider whether in England we have been doing anything very similar. I can only speak of building in the North, where we are accustomed to work harder, one hears, than the generality in the South. And in entering upon this phase of our subject I can only speak with authority upon those buildings coming under the jurisdiction of my own firm. There has been much talk about the number of bricks that can be laid per day. At the Westinghouse Works, Manchester, where I was associated as architect with Mr. Rodd, one of the first engineers of America, it has been said that on a part of the work 1,600 bricks were laid per man per day. It is quite correct. We have had this number laid in a two-brick wall at a very different kind of a building to a big works—Parr's Bank, Manchester to wit—with ordinary bond set by trowel in mortar made with Wormsworth Cliff lime. This was without paying extra wages either. But 1,600 bricks was not the average, and I know of no building where such has been the average. But you may learn something from the Westinghouse Works, although the conditions were not those of an ordinary building let under one contract to one builder. No contractor was ever asked to undertake the whole contract. All heavy work was let per ton, per cube foot, per square yard. The excavating was let to one firm, the steel to another, the slating to another, and so on—all English firms. On one side of the site were brick kilns, and whilst the excavations were in progress some 4,000,000 bricks were made and stored, the site was levelled, about eight miles of railway track laid down, connecting all parts of the works together, and proceeding from a main track from the Ship Canal Docks and the principal railway systems, timber was stored adjoining the rails, the large machine-shop foundations were in, the steel work well commenced—in fact, there was a quarter of a million pounds worth of work done or material delivered on the site before an American contractor came to employ bricklayers, carpenters, &c. He did not come as a contractor with a contract price for doing certain work, but as an official of the company. Therefore there is no comparison of this work with that of a general contract. But he got the work pushed on rapidly, and by saving time, saved the company interest on their money, and being empowered by an enlightened board to employ as many men as could be utilised, he accomplished the speedy work. And please note that the architects had every drawing ready. There was no delay of five minutes for instructions. There was nothing to wait for, and extra wages were given to men, enabling the best to be picked out and retained on the job. If you want brickwork executed at a great rate, have heaps of material ready, and put on every man you can. Pick out and keep the best men, discharge the others, and to entice the best men to your work and to spin out all they know, make it worth their while to stop by paying 10 per cent. more wages, give bonuses for work executed against time, and

have plenty of superintendents and foremen. It may not be the best finished or the most durable, but we are talking of speed and how to obtain it. A great feature in the speed of bricklaying is the kind of foreman employed. If he be a man of ability, understanding his work, and with sufficient will power to have the work carried out as it should be, and retaining only the competent workers, the work progresses properly. There can be no criterion of how many bricks should be laid in, say, backing up stonework, erecting buildings partly stone and partly brick; but in an ordinary building, faced with stocks, with stone dressings, general internal walls, with the usual doorways, arches, fireplaces, flues, beam filling, and such like, if a bricklayer averages throughout 700 English bricks of common brickwork per day of 10 hours, he is doing a fair day's work for 8s. 4d. An American friend of mine, Professor John Gray, of the North-Western University, Illinois, to whom I have been of service in giving data regarding British labour for his returns to the American Government, wrote to me in the spring of this year about bricklayers' wages in America. The *Chicago Tribune* of February 14, 1903, contained reference to this subject. It says:—"Some 4,000 members of the Bricklayers' and Stonemasons' Union have been granted a wage increase. The bricklayers have been getting 4dol. 40 cents a day for eight hours' work, and they ask for 4dol. 80 cents. This was given them as a set scale, and to be in force for three years. The men also demanded a half-holiday on Saturdays for six months in the year, and it was granted." This increase, without a strike, was equivalent to a rise of 10s. per week. Professor Gray added the following very expressive remark:—"It seems to me that, notwithstanding the numerous strikes in this country, our employers are more likely to grant demands, especially for increase of wages, than the English employer is, and to try to speed up to the new scale. I believe it cost less per 1,000 to get bricks laid new in Chicago than when men were paid 2dol. 40 cents for 10 hours' work, instead of the before mentioned 4dol. 80 cents for eight hours' work." This price is half a crown an hour. This would be an incentive to labour-saving machinery one would think. America is not without serious labour difficulties and strikes. In connection with this matter I have been at some trouble to obtain data of English bricklaying under English superintendence. I will cite a few, all of which have been vouched for to me. Great Northern Railway extension, Manchester, foundations 3ft. thick, hydraulic lime mortar, English bond, average 1,760 bricks per man in nine hours. The same building: stanchion foundations, blue bricks in cement, 1,056 bricks per man in nine hours. The same building: 3ft. wall, both faces finished with blue picked bricks in cement, 704 bricks per man in nine hours. The same building: wall 18in. thick, common brick in hydraulic lime mortar, English bond, wall faced one side in picked bricks, 846 bricks per man in nine hours. On a job in Bolton, 18in. wall, faced with selected bricks pointed up, 882 bricks per man in nine hours. At the same job, in an abutment 8ft. thick, faced one side with white glazed bricks in putty mortar, 909 bricks per man in nine hours. All these bricks were laid by men on ordinary wages of tenpence per hour under trade union rules, and without bonuses, &c. Let me give you another fair instance of this class of work. We, my sons and myself, have recently erected a refrigerating store near the Market, Manchester. It has basement and sub-basement and nine other floors. It is faced on two sides with stock bricks, panelled with arches, and has terracotta mouldings, bands, cornices, &c. Taking basement walls, face-work, setting round terracotta, windows, openings, lift recesses, &c., the brickwork from first to last averaged 750 bricks per man per day of ten hours, on ordinary wages. The most speedy erection of an ordinarily finished building ever managed in Manchester was that of Peak's Warehouse, Portland-street, in that city. It was done by Robert Neill and Sons, builders, under us as architects. It will be of interest to you to know the methods adopted, especially as it was entirely initiated, organised, supervised, and executed locally. It is only the laudations poured upon foreign work that have caused me to mention this. The building is a seven-storied warehouse for the home trade. There are three hoists, the usual counting-house, private office, kitchen, fittings,

&c. Every wall and ceiling plastered, and the building generally well fitted up with counters, electric light, &c. It stands on 1,000 square yards of land, and faces into three streets. The old building was gutted by fire on July 24, 1902. One side wall had to be taken down, one façade had the stonework of a floor to be replaced, and the back had to be half-rebuilt. In rebuilding it was decided to adopt more modern planning, which necessitated different lines of columns, increased height, and new work even to the column foundations. The clearance of the debris and insurance matters took until September 7. On that date the contract was signed. At the time of signature complete drawings and details were handed to the contractors, Messrs. Robert Neill and Sons, Manchester. We arranged that the steelwork should be erected by the steel engineering contractor, so that this part should not be dependent upon anyone. We had arranged with a mill to commence rolling for us within twenty-four hours of receiving our instructions, and also with a foundry to work in three shifts of eight hours each to get the cast work out. The whole work was under the immediate supervision and organisation of Mr. Harold Heathcote, one of my partners, with a clerk of works to keep the progress notes, &c. The result of organising and looking ahead, spending £500 for additional cost in pushed labour, and having a first-rate building firm to deal with, resulted in the whole warehouse being completed and business resumed on January 24, 1903, or twenty weeks from signing the contract. The cost was about £23,000. From the date of the contract to the time the whole of the iron columns, beams, and floor-joists for seven floors, inclusive of ordering, making, and erecting, were in position, was only seven weeks, showing what can be done if one only sets about it in the right way. It was the result of trained organisation and preparedness.

AMERICAN COMPETITION.

I have mentioned the thought Americans have put into some lines of business to undercut our manufacturers. Let me give one example in connection with our building trade. Perhaps in America the extremes of weather make it more a necessity to very carefully consider the question of heating buildings than with us. But it is of sufficient importance to our comfort and general health that our system and our appliances be as perfect as we could devise. Yet we did not as carefully study the subject as we might have done, until American competition has forced our manufacturers to do so effectually. It is an industry closely connected with buildings, so may be taken as an instance of how we did not master the subject as we might have done, and should probably have continued in complacent satisfaction had not American competition forced our heating-apparatus makers to do so for their own protection, and with the usual result, for some of our manufacturers are to-day producing cast sectional boilers and radiators equal to either American or French in price, finish, and efficiency, although not yet in as many varieties or of the largest capacity. If they will do this, they will at least again command the market of their own country, and they may be trusted to then push forward the export of their wares. To obtain the best article the American manufacturers concentrated their fullest thought, energy, and scientific knowledge upon the character of the metals best adapted to meet the various requirements of softness, non-porosity, smooth clean finish, and uniformity of thickness in casting. This was specially directed upon what are known as sectional boilers where enormous heating surface is required, where the pressure is high. With them method and standardising are enforced in fitting and erecting, and in having the template of each member numbered and indexed before leaving the works, so that in the event of any of the component parts requiring renewing they can easily be duplicated. Large quantities of radiators have been shipped to Europe within recent years. One firm at all events was quite prepared to have their work done in France, because it was found that the French workmen bestowed greater care and interest on the moulding and casting of radiators, producing a most reliable and beautifully finished article. These improvements, as I have said, were so materially affecting the English trade that the necessary incentive was created—the incentive of self-interest, and we are again holding our own. We shall do more than this if our manufacturers will give up their conservatism

altogether and increase the varieties, and also the capacity, of the heating boilers, and not need more foreign competition to jog them up again. We were slow to adopt the telephone, electric tramcar, the electric light, the motor-car. We sometimes expect to compete successfully with those countries which adapt themselves to the quickly-changing conditions of life. It is our conservatism that is injuring us; and it might be added it is competition that is stirring us up. The young Englishman in this or any other business needs to devote more time to studying the technical details, learning the methods of other countries, and from that knowledge striving for high standard of workmanship and enterprise in combination with originality. May I suggest that the Institute of Builders use their influence towards getting all apprentices to pass through building construction classes in the technical schools? In very large buildings where there is much architectural treatment involved, the architect is generally very fully employed in quietly, earnestly considering and working out the details of his design, and will perform that duty more whole-mindedly if not constantly diverted by personal superintendence as well. It may be worth consideration if there might not be with advantage in, say, great Government contracts, an architect, associated with the designing architect, who will have the entire charge of superintendence. And for each of these architectural positions the best man for English buildings is a trained, energetic, high-minded English gentleman. There are many men answering this description, and as capable as can be found in any land.

LABOUR.

The question of labour is most difficult to answer. Quoting from a work by Mr. J. F. Fraser:—"The raw material from which America produces its workers is the finest procurable in the world. America is not the dumping ground of the world's refuse. The immigrants into America are hardy Europeans discontented with the conditions in the old countries, but who have saved enough to set out and try their abilities in the new. Daring, pluck, and enterprise are necessary to break with family ties, and the men who have shown sufficient courage to do this are the very men likely to prosper wherever they settle." And this emigration is a great matter with us. In America, if a man does not work up to all that is in him he is discharged, for there are plenty coming by the next boat to take his place. With us our numbers of the best men are not thus increased, and the trade unions sometimes discourage the good man to do his best, but encourage him to slow down to the level of the poor one. It is often the best men who emigrate, and their places are to some extent filled with an unrestricted pauper refuse from any country wishing to get rid of them. Is this reciprocity? Do we legislate, as I have said, in this, as in our patent laws, for our own country's benefit, and for the advantage of our own people? We are not as alive as we ought in common sense to be for our own interests. This immigration and emigration are serious items in the labour difficulty. It can only be restrained by our working men knowing they will have as much reward here as elsewhere in return for their best endeavours. Do you offer any rewards to your workmen for improvement of knowledge, for suggesting improvements, for specialised ability, thus giving them increased interest in their business? The American gets a real honest joy out of his working. He likes it. His interest is in it. He is optimistic. He knows there are openings for his progress. He has a magnificent belief in his own abilities, and loves to read those papers which prove what a fine fellow he is, and how he overcomes the sleepy European. Enthusiasm is in the air. There is no do-nothing class supposed to be on a higher plane than business men. He sees the wealthy around him working as hard as he does. His English fellow is taught by his Union that if an American lathe-turner works four lathes it is no reason he should be allowed to work more than two, caring not whether the trade thus leaves his employer or not. There is a greater readiness generally in the States to listen to the suggestions of the workpeople, and many of the labour-saving machines are the outcome of this better understanding, and if you look into it you will find English brains well to the fore in inventions. The greater interest of the workman in his work, his endeavour to rise in the world, the better-schemed education he has received, and the

readiness of the employer to listen to the suggestions of improvements, are all factors stronger in the States than in England. The sentiment in England, that a man who belongs to an idle, leisured class is for that reason to be envied, forms a great drawback to progress and efficiency. This example to those less blessed with the world's goods does not tend to enthusiasm for diligent work. To see the wealthiest working hard in the business gives a solidarity of interests, a feeling of contentment to all engaged therein. An American's ambition for wealth and the power wealth gives is greater than ours. He will work longer hours, and when there is no need for it, in order to add wealth to wealth. Whether, in the one life we have, this is a true and worthy ambition is another story, not falling within the lines of this paper. The American employer considers the health and comfort of his people as conducive to his own interests, and endeavours to meet this end by considering their welfare in the dining-rooms and conveniences of the workshop. In many works each man has a locker for his clothes, and has ample arrangements for keeping himself respectable in cleanliness and appearance. It must be admitted there has been no lack of Government interference on behalf of the English workman. Innumerable factory acts, special rules, compensation bills, Board of Trade regulations are in force here that have no existence elsewhere. I believe we shall adopt many American business methods here, altering many of our conditions, and bringing about a more mutual appreciation of the difficulties between employer and employed. This is very necessary to modify the actions of trade unions in those directions for curtailing the output of material and hampering a free working man in doing the utmost he can with his labour, which is his capital. It is the old story in England. The first brickmaking machines were invented in England, but the men working them were murdered. The first building in Manchester where men dared carry bricks without the ordinary hod was the Town-hall, less than 30 years ago. Even then the contractors had to obtain the protection of the police. The whole fallacy of the union's policy of allowing and encouraging a man to do less than a fair day's work in order that some other man may get a job depends, it would seem, upon the false assumption that the amount of work to be done is a constant quantity. There is no limit to the work to be done if we can do it quickly and economically, for there is no limit to human wants. I am indebted to Mr. Mortens, who says:—"Whilst unregulated and unorganised labour must be deprecated, the labour organisations must not block economic progress: the newest machines replacing costly labour must be adopted and be worked as cheaply and efficiently as possible, and the output increased wherever desired. To restrict the better educated and skilled workmen from doing the best and the most they can is an economic fallacy which, if persisted in, will utterly ruin the trade of England. With the adoption of machinery, wages have risen all over England; with the adoption of more modern labour-saving machinery American wages have risen still more. But the fault does not lie with the workers alone. Employers in England have yet to learn the economy and efficiency of high wages, and to acquire some of the intensity of application of their American competitors. It would be very advisable for contractors to spend some time in the States closely and earnestly studying the methods of labour, combination, &c., mentioned. Americans are very hospitable, and will give you a hearty welcome. There is no hampering an American workman in his business. If he can set bricks he is taken on as a bricklayer, and the other workmen do not strike the job because he has not been a bound apprentice for four years. Here it is once a labourer always a labourer; but, there, you are a bricklayer if you can lay bricks. There is also a spice of adventure about the American working man: he will cease to be a watchmaker and take to farming; give up newspaper reporting to start a constructive engineering company, a patent roofing or a patent flooring company; a builder's pay clerk will start, in conjunction with a student, for "electrical equipment in all its departments and permanent-way constructors." It is risky to himself and all who employ him, and shows nothing from which we can derive any benefit. The drink statistics show that the expenditure per unit here is twice as much as in America. If

our workmen would spend only one-half what they do in this line, their wages would increase by their working on St. Monday, now an off-day, and their savings result in scores of millions going into reproductive trade. We should not hear much then about the alteration of Fiscal Policies, for we should be fully employed in one great boom of trade. One way to lessen the difficulty with labour is to pay the best man the best wage you can afford him so long as he gives you his best; make him to realise his best friend is his employer, and that it is his personal advantage to forward the employer's interests. In that manner you will retain the men you really need, and give the natural incentive to the workman's progress and advancement. It is desirable to guard myself from the supposition that I think the struggle to accumulate money should be engrossing, and that it should be a main object of life. I am aware of the grave danger of allowing the consideration of industrial problems to obscure those of a social character. The productive activity of the people depends on their physical, moral, and intellectual qualities, and unless we improve these the industrial problem will hardly be solved. But I do maintain that whilst in business you should do it to the best of your ability, and, if you can learn from your competitors any element of success and method, it is a part of your duty to obtain it, and act upon it with wisdom and with energy. And further, business men should develop the power of initiation, and improvement even upon those desirable elements that are to be gathered from others. We have not yet attained to full perfection in anything, and the future is in the hands of the man with brains to think, self-reliance to carry out, and energy to complete. Many there are amongst us doing this now, making earnest persevering efforts, but the wish to do it is far from universal: far from being the ambition that it should be, and indeed must be if we are to retain all along the line our position in the business world.

CHIPS.

The new town-hall at Chippenham, built at a cost of £35,000, on the site of the Winter Gardens, will be opened to-morrow (Saturday) by the Right Hon. Sir Michael Hicks-Beach, M.P. The architect is Mr. F. W. Waller, F.R.I.B.A., of Gloucester, and the contractors are Messrs. Collins and Godfrey, of Cheltenham and Tewkesbury.

Precentor Donaldson delivered last week at Truro a lecture on the new cathedral in that city, in which he pointed out that although many people complained that it was not faced with Cornish granite, he did not agree with them. Granite did not lend itself to rich ornamentation, would have taken much longer to build, and would have been exceedingly costly. The erection of the cathedral had not only been for the glory of God, but undoubtedly it had benefited a large number of workmen for a considerable number of years. Two-thirds at least of the cost of Truro Cathedral was paid for labour to those employed on the works, and a great deal of the money had gone into the pockets of Cornishmen.

The Dunfermline District Committee of the Fife County Council, at a meeting on Tuesday, approved of a provisional order for providing a water supply for the district at a cost of £104,000. The site of the new Naval base is included within the district, and it was stated that the Admiralty had practically come to an agreement to pay one-third of the total cost of the new waterworks conditionally upon receiving one-third of the total quantity of water available.

The following century-old paragraph has an up-to-date ring about it. "The improvements west of Temple-Bar to open the entrance into the City proceed much slower than could be wished, both for the sake of the neighbours and the public at large. When finished they will render this avenue a great ornament to the Metropolis." It appeared in the *Times* of Friday, December 2, 1803.

On Saturday the shaft of the new electricity works on the western shore at Southampton was completed. The shaft is 200ft. high, and is the highest in Southampton, with a diameter in the flue area of 14ft., and at the top of 11ft. The shaft was erected by the Alphonso Custodis Chimney Construction Co., and was carried out under the supervision of the borough engineer, Mr. J. A. Crowther.

An inquiry was held on Friday at Burnham (Somerset) town-hall, by Mr. E. A. Sandford Fawcett, on behalf of the Local Government Board, of whom the urban district council seeks powers to borrow £3,450 for the purchase of the Manor House property for purposes of public walks and pleasure grounds. There was no opposition.

OBITUARY.

ONE of the most eminent and successful civil engineers has just passed away at the ripe age of eighty-five in the person of SIR FREDERICK JOSEPH BRAMWELL, Bart., F.R.S., who succumbed on Monday to an attack of hæmorrhage on the brain. The third son of Mr. George Bramwell, banker, of Finch-lane, and younger brother of the late Lord Bramwell, Frederick Bramwell was apprenticed in 1834, at the age of 16, to John Hague, an engineer of the old school, and remained with him as chief draughtsman for some years after his apprenticeship had expired. After some experience in various offices Bramwell commenced practice for himself, and speedily became known as an authority on waterworks and mechanical engineering, and as a lucid witness and painstaking arbitrator. In 1874 he became President of the Institution of Mechanical Engineers, and delivered a stimulating address upon the duties and responsibilities of its members, with a suggestive inquiry as to the possibility of the exhaustion of our British coal supplies. Eleven years later, in 1885, he was elected as President of the Institute of Civil Engineers, a body formed in the year of his birth, 1818. In his presidential address he dealt with the chief factors of past progress, as exemplified in the Inventions Exhibition then opened, and of whose executive council he was chairman. Sir Frederick also strongly urged the desirability of the treatment of heavy steel forgings by hydraulic pressure in place of steam-hammers, and has lived to see this method universally adopted. His presidential address three years later to the British Association at their Bath meeting in 1888 was noteworthy for the brilliant humour and the high literary ability with which the theme of next-to-nothing was treated. He was knighted in 1881, and received, eight years later, a baronetcy, which now becomes extinct. He is survived by his two daughters, now respectively Lady Horsley and Lady Bliss.

THE death is announced, in his seventy-ninth year, of Mr. THOMAS JOHN WILLSON, formerly in practice as an architect and surveyor, the elder son of Edward James Willson, the distinguished antiquarian. Born at Lincoln, the late Mr. Willson was educated at Oscott College, and begun work in his father's office in Lincoln Castle. He planned, says Mr. S. J. Nicholl, in the *R.I.B.A. Journal*, a work on the choir stalls of Lincoln Minster, making many careful sketches and drawings. He, however, was not encouraged to proceed to publication. He pursued his studies on the Continent. His drawings of the metal screen in the Church of Santa Croce, Florence, and of several objects from the treasury of St. Mark's, Venice, were published by Sir M. Digby Wyatt in his "Specimens of Ornamental Metal Work." In 1846 he accompanied Mr. F. C. Penrose to Athens, to assist him in the researches then made for the monumental work on "The Principles of Athenian Architecture." Mr. Penrose, in his preface, speaks of "the beautiful drawings" from which the plates were engraved, as prepared "by my friend and companion, Mr. T. J. Willson," who also "rendered valuable assistance in many other respects." Other illustrations are scattered in various publications: the plates of the pulpit in the Refectory of Topholme Priory, Lincolnshire, in Collings' "Details of Gothic Architecture," were by him, although not signed. The general practice in his father's office made him a specialist in agricultural buildings: the plate illustrative of this subject in the Dictionary of the Architectural Publication Society was contributed by him. At Burnley, he acted for some time as surveyor to the estate of Mr. Charles Townley. Later on he also erected farm buildings at Acton-Burnell and elsewhere. "In 1854 circumstances led him to work with me," Mr. Nicholl adds, "in the enlargement and renovation of the Catholic Chapel at Lincoln (an interior view of this edifice was given in the *BUILDING NEWS* of June, 1861), and on his return to London in 1859 we commenced to work together, and continued to do so till 1869. During this period the public buildings we erected included the chapel and lodge of St. Patrick's Cemetery, Low Leyton, consecrated in 1861; the churches of St. Charles Borromeo, Ogle-street, London; of the Sacred Heart, Accrington; St. Mary, Turnham Green; St. Catherine, West Drayton, and at Bilbao, in Spain; schools of St. James, Spanish-place, Wapping, Little Crosby, and at North Hyde, Middlesex; and additions to the Convents at

Atherstone and Chelsea. The last work he undertook was, in 1896, the girls' school attached to the Dominican Priory, Haverstock Hill; in the preparation of the drawings for this work, I, at his request, was again joined with him. To this list must be added two memorials erected at Portsmouth in 1862, from our own joint designs—that to Sir Charles Napier and of the Cruise of the *Chesapeake*. Mr. T. J. Willson was an Associate of the R.I.B.A. from 1854 to 1900, when he resigned; but of late he gave up much time to the office of honorary secretary to the 'Aged Poor Society and the Guild of St. Gregory and Luke,' an ecclesiastical society, and, above all, to the collation of his father's 'Lincoln collection.' To this he added many of his own careful drawings, hoping that some public body would have acquired and kept intact the entire collection; in this he was disappointed."

MR. EDWARD JAMES MARTIN, M.Inst.C.E., F.R.I.B.A., late Secretary to the Government of Bengal in the Public Works Department, died at Brighton on Tuesday in last week. Appointed to the Indian Civil Service in 1859, Mr. Martin served in the Punjab in the Buildings and Roads Branch as assistant and executive engineer till 1869-70, when he was transferred to the North-Western Provinces, and posted to the Rajputana State Railway. He afterwards officiated as engineer-in-chief of the Tirhoot State Railway and of the Rangoon and Irrawaddy Valley State Railway, and also as ex-officio manager of the latter line, being transferred to the railway branch in Bengal in November, 1878, and appointed engineer-in-chief of the Central Bengal System of State Railways. In January, 1880, he was promoted to be superintending engineer of the third class. The following year he was employed on special duty under the chief engineer in Bengal as Government architect, was promoted to the second class in 1882, and deputed to Indore on special duty in 1884. Mr. Martin reached the rank of superintending engineer of the first class in December, 1885, was officiating chief engineer and secretary to the Government of Bengal in the Public Works Department from June, 1888, till May, 1889, when he was appointed second chief engineer, and from January, 1890, till his retirement in 1891 was chief engineer and joint secretary to the Government of Bengal. Mr. Martin joined the Royal Institute of British Architects in 1874 as an Associate, and became a Fellow nine years later. He had been a Member of the Institution of Civil Engineers since May, 1875.

WE regret to learn that Mr. LOCKERBIE, the managing director of the firm of Lockerbie and Wilkinson, Ltd., of Birmingham and London, died this week. No details are as yet to hand, the news only reaching Birmingham by cable on Wednesday from Johannesburg, whither the deceased had gone on a business trip.

At the meeting of the managers of the Metropolitan Asylum District, held on Saturday, a letter was read from the Local Government Board promising to issue an order authorising the expenditure and borrowing of a sum not exceeding £15,000 in respect of the proposed alterations and additions at the Fountain Hospital, the loan to be repaid in five years.

The Lord Mayor will unveil on Tuesday the bust of Chaucer by Mr. George J. Frampton, R.A., which Alderman Sir Reginald Hanson has presented to the Corporation of London for their Art Gallery at the City Guildhall.

Monday was the final day at the Houses of Lords and Commons for receiving plans and other documents in connection with private legislation for the ensuing Session of 1904. The total number of deposits was 272, as compared with 294 at the corresponding period of last year, the details as regards last night being: Railways 26, tramways 26, miscellaneous 62, and provisional orders (including electric lighting) 158. The figures of last year were: Railways 46, tramways 35, miscellaneous 60, and provisional orders (including electric lighting) 150.

Mr. E. C. Sandford Fawcett, M.Inst.C.E., held a Local Government Board inquiry at the Hall Evercreech, Somerset, on Thursday in last week, into the application of the Shepton Mallet Rural District Council for sanction to borrow £700 for the purpose of a water supply to the hamlet of Chesterblade.

A special meeting of the Beccles Town Council was held last week, when a committee of the whole council presented a report recommending, from among 68 candidates, Mr. T. Owen Cudbird to the office of borough surveyor in place of Mr. T. W. Woodroffe, resigned.

Building Intelligence.

BRETENHAM, NORFOLK.—The final touches to the restoration of this church have just been made at the charge of Mr. J. Musker, of Shadwell Court, Thetford, patron and lord of the manor. All the windows have been filled with stained glass. A carved oak reredos, with painted panels of scriptural subjects, has been fixed over the altar. A new organ has been placed in the north transept. Oak panelling, sedilia, credence, and choir stalls of very elaborate design have been executed for the chancel. A carved oak rood screen spans the chancel arch. The chapels of the north and south transepts are divided from the nave by a wrought-iron grill, and a similar screen divides the tower from the nave. All the walls of the church have been painted and decorated with diaper work. From the roof hang wrought-iron electroliers of elaborate design. The floors are laid with marble slabs, rough, white, and dove-colour. The roof and seats are stained and varnished, a seating of Wilton carpet covering all the pews. A carved oak pulpit and brass eagle lectern were also supplied. The whole of the work was undertaken and executed by Percy Bacon and Brothers, of 11, Newman-street, London, W., at a cost of £2,350.

HOLLINGBOURNE.—On Tuesday the Archbishop of Canterbury held a Confirmation service in All Saints' Parish Church, Hollingbourne, and dedicated the new vestry, organ-chamber, and reredos. The vestry (built by Messrs. G. Ansett and Son, at a cost of £400) is to the memory of the late R. G. De Visse Thomas. It is built of Kentish rag, from designs by Mr. W. D. Caroe, F.S.A., architect to the Ecclesiastical Commissioners. The organ, by Messrs. Norman and Beard, has been removed from its old position on a gallery at the west end, and has been re-erected and enlarged in an organ-chamber above the vestry, the chancel wall being pierced to show the fine front of the organ. This work has been carried out by Mr. W. Walmsley, at a cost of £100. The reredos, executed by Mr. Nathaniel Hitch, of London, from designs also by Mr. Caroe, is to the memory of the late Dr. E. M. Goulbarn, Dean of Norwich. The reredos itself stands on a carved retable of old dark oak, and is of open carved light oak, surmounted by an open-worked canopy of columnar pillars; the background is of purple. The centre contains a representation of the Crucifixion in relief. The panel on the right represents the Virgin Mother, and that on the left St. John.

STOKE DAMEREL, PLYMOUTH.—The Parish Church of Stoke Damerel, one of the oldest ecclesiastical buildings in South Devonshire, has for long been in a state of decrepitude which rendered the erection of a new building to take its place absolutely necessary. On the feast of St. Andrew, the patron saint of the parish—a portion of the new church, comprising the morning chapel and crypt, was dedicated by the Bishop of Exeter. The new building, which it is proposed to erect at a cost of about £20,000, exclusive of the cost of the tower, will, when completed, accommodate 1,400 people. A site has been secured adjoining the rectory, and there have now been built a morning chapel, which will seat about 150 people, and a crypt containing a sub-chapel, sacristy, a clergy and choir vestry, and accommodation for a Sunday-school. The style adopted is Gothic, and the material used for the exterior is a blue polyphant stone. The interior is lined with Bath stone, which contrasts effectively with an open-ribbed barrel roof. The architect is Mr. W. D. Caroe, M.A., of London, and the work is being carried out by Messrs. William Dart and Son, of Crediton, under the supervision of Mr. Bolwell as clerk of works.

At the London Guildhall, on Friday, Walter Theodore Seldon, surveyor, of 24, Canning-road, Croydon, was charged with embezzling cheques for £23, £18, and £21 respectively from his employers, the Corporation of London. Sir H. H. Crawford, City Solicitor, who prosecuted, said defendant hitherto held an irreproachable character and a responsible position, and it was to be hoped he would be able to give a satisfactory explanation. A remand was granted, bail being refused.

Mr. J. F. Delaney, assistant engineer to Dublin Corporation, was unanimously elected on Friday to the position of city engineer for Cork, in succession to Mr. Henry A. Cutler, who has been appointed borough surveyor of Belfast.

Engineering Notes.

LONDON COUNTY COUNCIL TRAMWAYS.—In connection with the general electrification of the tramway system of London, the London County Council adopted, on Tuesday, the proposals of the Highways Committee for dealing with the northern lines which have been leased to the North Metropolitan Company. It has been decided that certain sections of the lines which could be worked with through services of electrical cars shall be first reconstructed, and to these it is intended to apply the underground conduit system of electrical traction. The lines in question are—(1) Theobalds-road terminus, via Clerkenwell-road, Old-street, Great Eastern-street, Commercial-road, and Leman-street to near the London Docks; (2) Norton Folgate terminus, via Shoreditch, Kingsland-road, High-street, Stoke Newington-road to Stamford Hill; (3) and Aldgate terminus, via Commercial-road, Commercial-road East, and East India Dock-road to Poplar; (4) Moorgate-street terminus, via Finsbury-pavement and City-road to junction with Old-street; (5) Holborn terminus, via Gray's Inn-road to junction with Theobalds-road; and (6) along Old-street between Great Eastern-street and Shoreditch. The length of these tramways is about 22½ miles of single line, and it will be practicable for the whole of them to be worked from the electricity generating station which is being established at Greenwich.

CHIPS.

A faculty is to be applied for for restoring the church of King Charles the Martyr at Tunbridge Wells, at an estimated cost of £500.

The Light Railway Commissioners have given their sanction to a scheme for constructing an overhead traveller bridge and electric tramway to connect Portsmouth with Hayling Island. The total cost of the scheme will be about £63,000.

The erection of the first section of Christ Church, Whaley Bridge, which will be a chapel-of-ease to Chapel-en-le-Frith Parish Church, is progressing, and it has just been decided to add a spire to the present structure. It is expected to be complete by Easter next year.

The King has accepted from Mr. J. Brickwood an offer to bear the outlay involved in building a church at an estimated cost of £20,000 for the Midhurst Sanatorium for Consumptives.

A baptistry, with memorial stained-glass window has just been erected at the west end of St. Mark's Church, Tunbridge Wells. It is the gift of an anonymous parishioner, and has cost over £300. During the present year some members of the congregation have built a choir vestry at the cost of £700. The stone for this building and for the baptistry was given by the patron, Lord Abergavenny, whose father founded the church. The son of the original architect drew the plans. The son of the builder carried out the work, and the son of the nobleman who, forty years ago, had decorated the reredos has now restored his father's work.

The London County Council again give notice of their intention to apply to Parliament in the session of 1904 for leave to bring in a Bill for the purpose of dealing with the Thames steamboat service.

At a special meeting of Grangemouth Town Council on Friday, it was agreed to borrow the sum of £30,000 for the New Bannock Burn water scheme in terms of the provisions of the Burgh Police (Scotland) Act, 1892.

A Local Government Board inquiry was held on Friday in the Gorton Town Hall into the District Council's application for sanction to borrow £8,925 for works of street improvement, and £2,261 for a park at Sunny Brow.

Mr. George Goulding, J.P., of Romsey, head of the firm of Goulding and Sons, builders and contractors, for the past twelve years, and a member of the town council for that borough, died last week, aged 51 years. The business was established by the deceased's late father many years since.

Mrs. Eleanor Freeman, widow of the late Dr. E. A. Freeman, Regius Professor of History at Oxford, and the well-known writer on ecclesiastical and antiquarian topics, died on the 26th ult. at East Liberty, Wells City, the residence of her son-in-law, Canon Scott Holmes. Mrs. Freeman was in her 87th year. The daughter of the Rev. R. Gutch, to whom as a private pupil the late historian went in 1840, she became engaged to Mr. Freeman while he was still an undergraduate at Trinity College, Oxford, and was married to him in 1847, two years after Mr. Freeman had obtained his degree.

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Our Illustrations.

NEW MODEL LODGING HOUSE, NEWCASTLE-ON-TYNE.

THIS building provides accommodation for 240 loafers. On the principal floor are the dining-room, recreation-room, and smoke-room, and off the main corridor are the lockers. The dining-room is served from the kitchen on the same floor, and a lodgers' scullery is provided where the men may prepare their own food and cook it at the hot-plate range in the dining-room. A shop is also provided for the sale of groceries, &c. The rest of the administrative part of the building is on the basement, comprising linen stores, servants' quarters, &c. The conveniences are all at the back of the block, and are top lighted and ventilated. The lodgers' scullery is in the basement. On the four upper floors are the cubicles, each cubicle having a separate window. The architect is Mr. J. C. Maxwell, A.R.I.B.A., of Newcastle-on-Tyne.

HOSPITAL FOR THE CITY OF LEEDS AT SEACROFT.

THE hospital which we illustrate to-day is situated about three miles from the heart of the city, in a beautiful wooded park, at an elevation of over 300ft. above the sea. The buildings are spread over a site of over 40 acres, the actual length from one end of the hospital to the other being a quarter of a mile. The administration buildings are in the centre of the view, the wards to the right (or east) being for scarlet fever, with a convalescent home to the extreme left. South of this is a clubhouse for the staff. To the west of the administration blocks are the pavilions for diphtheria and enteric diseases. In addition, there are isolation pavilions for other types of disease. Attached to the hospital is a quarantine station of many cottages, to which infected families are removed until danger is passed. Exclusive of the cottages, accommodation is provided for 452 patients, with a staff of about 220. The entrance is from the main York road. Grouped near the lodge are, on the west, the mortuary, mortuary chapel (with waiting-room), pathological laboratory, and postmortem room. To the south of this a complete ambulance-station; near by a waiting-room for visitors to patients; and on the other side of the road a discharge block for patients. The chief medical officer's house is further to the east in a private garden. The steward's house is near to the stores yard. These are accessible only from the highway. Sixteen cottages provide for married officers. Opposite the official centre of the hospital is a clock and water tower, 110ft. high, containing an illuminated clock with dials 8ft. diameter, and a large storage of water. The administration block consists of the offices and residences for the chief officials, the nurses' home, the female servants'

home, the hospital kitchen, with dining-rooms for the staff in close proximity, steward's stores, dispensary, &c., a students' block, with complete laboratory, forming another building. The hospital wards are one story in height, all connected by glass-covered ways, with subways for steam, water, electric, and gas mains, &c. The heating is by hot water pumped from a central station. The buildings are lighted by electricity throughout. There is a complete operating theatre, &c., and special operating rooms are provided in the diphtheria pavilions. The general contractors are Messrs. Arnold and Son, of Doncaster. The chief clerk of works is Mr. A. Turner, and the engineering clerk of works is Mr. Rayner. The architect is Mr. Edwin T. Hall, F.R.I.B.A., of Bedford-square, London, W.C.

STUDIES OF OLD WROUGHT IRON WORK.

EVERY piece of door furniture drawn on the accompanying plate has its nationality and century inscribed next it, and all the articles are detailed in a useful and careful manner, set out in a business-like fashion. A prize was awarded to the author, Mr. Thomas Batty, of Leicester, for the two sheets of ironwork submitted in the National Competitions for Historic Ornament. The other sheet we shall hope to illustrate shortly.

HOUSE AT HATCH END.

THIS house, which has been erected at Hatch End for Mr. Percy Machin, is treated externally with white roughcast, red tiles to roofs, and red brick chimneys and plinth roofs and black timbers. The interior contains a great deal in oak, chiefly in the doors, ingle nooks, principal staircase, and beams throughout the house. The ground floor consists of entrance hall and staircase hall, with oak screens and open-timber ceilings; sitting hall, with large ingle and red-bricked arched dog fireplace, timber ceiling and beams; drawing room with two large bays; billiard-room 30ft. by 24ft., with large raised ingle-nook and heavy, timbered ceiling; dining-room with large bay and ingle-nook; study, and very complete servants' offices, storerooms, photography and bicycle rooms. The upper floor is approached by two staircases, the principal staircase being 5ft. broad. There is a long main corridor, opening out into which are ten bedrooms, one having a large ingle-nook. The large spare room has a quaint staircase leading up between solid 9in. by 9in. posts and beams, and an open screen to a dressing room over. The whole house is fitted with Well fire stoves in brick, with brick-on-edge raised curb hearths, and the whole of the door furniture, gas standards on staircase and ingle-seat newels, gas brackets, &c., are all purposely made in hammered metal. The whole has been carried out from the drawings supplied by and under the direct supervision of Mr. Melville S. Ward, F.R.I.B.A., and the contractor was Mr. J. Page, of Northwood.

BUSINESS PREMISES, BRIDLESMITH GATE, NOTTINGHAM.

THE two lower floors of these buildings are devoted to showrooms and shops, with large windows essential to this class of business. The arched doorway to the right leads to the offices above stairs. The elevations are in red brick and stone. Mr. Gilbert S. Doughty, of Nottingham, is the architect.

SALE ROOM AND OTHER SKETCHES.

THE old Wheel-back Chair, from a recent sale south of the Thames, fetched the very small figure of £1 6s., and it is in a first-rate condition. The Gothic Chippendale Chair is one of two made for George III., from designs by Kirby, designer to the King, and consequently it has a personal interest. The carved oak Cabinet in the centre of the sheet is more uncommon, and has small drawers in the plinth part, the upper body being separated from the lower by a moulding above the ordinary level. The Staffordshire Toby-tossers describe themselves, and the group of Old Pewter completes the page.

WEEKLEY HOSPITAL.

(For description, front elevation, and plan, see page 776.)

The official opening of the filters erected at Bomains by Bo'ness Town Council took place on Friday. The filters, which are the Bell patent process, were fitted up at a cost of £3,000, and put the copstone on the Lochcote water scheme, which has cost the ratepayers £30,000.

COMPETITIONS.

ILKLEY FREE LIBRARY.—At a special meeting of the Ilkley Urban District Council held on Friday night, it was decided to adopt a scheme involving a total expenditure of £10,000 (including a grant of £3,000 from Mr. Carnegie) for the erection of the proposed free library, public offices, and assembly-hall. Competitive designs for the buildings are to be asked for, and three premiums offered—1st, £100; 2nd, £50; 3rd, £20.

CHIPS.

Messrs. R. T. Relf and Son, railway contractors, have been intrusted by the G.W.R. directors with the contract for doubling the Cornish line from Saltash to St. Germans.

On Wednesday week Mr. E. A. Sandford Fawcett, M.Inst.C.E., Local Government Board inspector, held an inquiry at the Public Offices, Frome, into the application by the urban district council to borrow £3,500 for purposes of electric lighting, £600 for the purpose of making a new road from Portway to Lock's Hill, and £500 for works of sewerage.

The Metropolitan Water Board have approved an agreement to pay to the local authorities of Tottenham and Enfield the sums of £77,750 and £66,000 respectively for the transfer of their water undertakings to the Board. Certain recommendations as to the management of the water undertakings have been agreed to.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £60,725, and for the corresponding week of last year to £146,123.

The salary of the gas and water manager of the Goole Urban District Council, Mr. T. E. Franklin, has been increased from £225 to £300 per annum.

The new church of St. Andrew at Marsden Colliery, near South Shields, was opened by the Bishop of Durham on Monday. It replaces an old building, and is of stone, erected from plans prepared by Messrs. J. Potts and Son, architects, Sunderland, Messrs. W. D. Allison and Son, Whitburn, being the contractors. There is sitting accommodation in the nave for 200 persons. The outer walls are of Marsden limestone, with freestone dressings, and the internal fittings and seats are of pitchpine.

A new school, which has been erected by the Roman Catholics of Lochgelly, was formally opened on Monday evening by Archbishop Smith. The school has cost £3,000, and has six large classrooms, providing accommodation for over 300 pupils.

Mr. Meade-King, an inspector of the Local Government Board, has held an inquiry at the Derby Town Hall respecting an application of the corporation to borrow £33,400 for extensions of its electricity generating plant and mains, and the provision of generating plant for supplying power to the new electric tramways; £2,225 for works of sewerage, and £695 for street improvements.

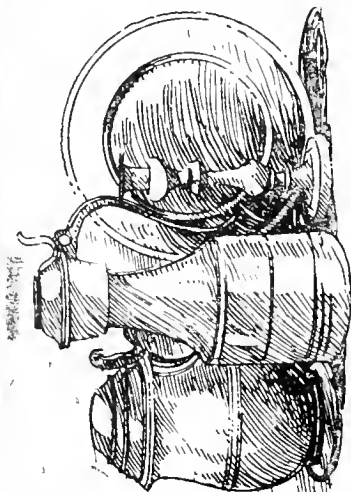
The house of Mr. Labouchere, M.P., in Old Palace-yard, having been purchased by the Government for the purpose of accommodating Royal Commissions, will in future be known as the Royal Commissions House, and will shortly be occupied by the Royal Commissions on Sewage Disposal, Coal Supplies, the Militia and Volunteers, and Trade Disputes and Trade Combinations.

The City Council of Westminster have decided to order an inquiry into the manner in which the paving contracts and street repairs for the current year have been carried out. It was stated that most of the work had been two months behind the scheduled time, and that grave complaints had come from clubs and hotels in respect to the delay.

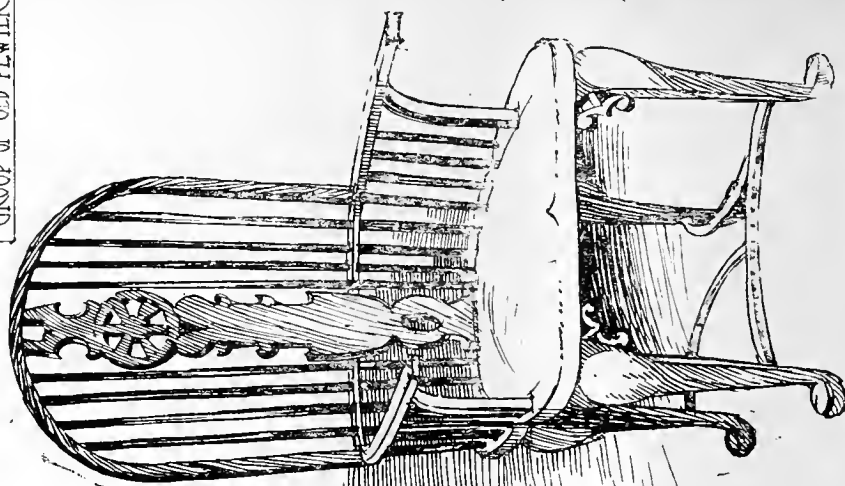
The London County Council has agreed to advance the Marylebone Council £12,265 for the purpose of erecting a block of artisans' dwellings on the John-street site at £3 15s. per cent. per annum, the loan to be repayable within 60 years. A provisional scheme has been prepared, to be carried out at the joint expense of the County Council and the Borough Council, for clearing the Devonshire-place insanitary area and building thereon four blocks of industrial dwellings.

The Bishop of Rochester inaugurated, on Tuesday, the opening of the Belgrave Hospital for Children, Clapham-road. This hospital was originally founded in Pimlico, in 1867, and has been removed to its present site for the purpose of serving a larger working population. The new buildings have been erected from plans by Mr. H. Percy Adams, F.R.I.B.A. The section completed consists of the centre, east, and part of the south wings, and outpatients' building and mortuary, including three wards with cots, babies' ward, in all about 35 cots, and offices for the staff. The cost has already reached £37,000, a sum which includes the site. In order to complete the equipment a further sum of £15,000 is needed.

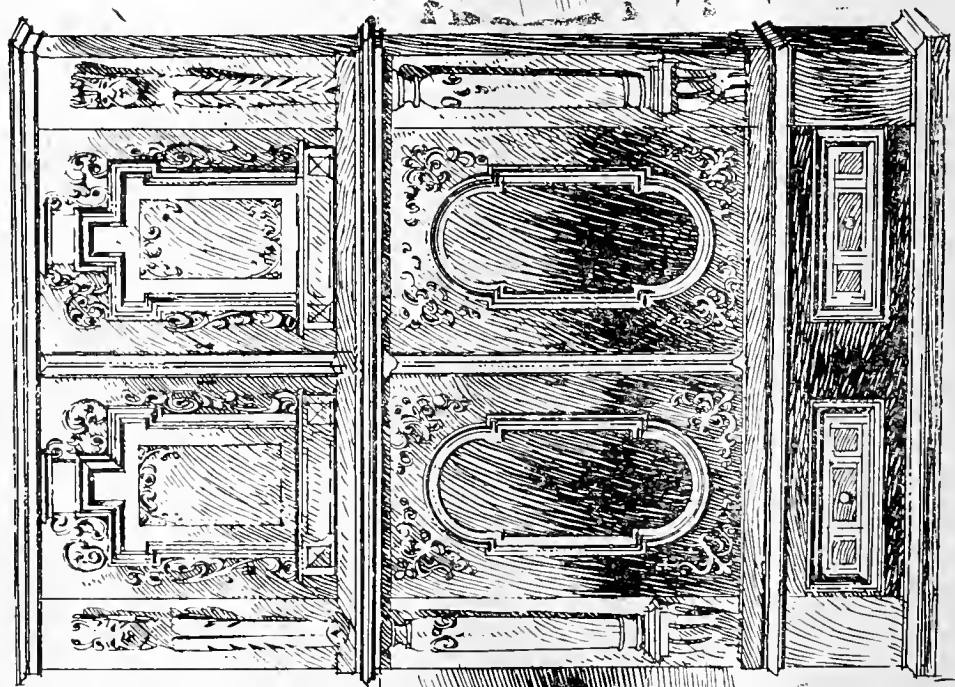
SALE ROOM AND OTHER SKETCHES



GROUP OF OLD PEWTER.



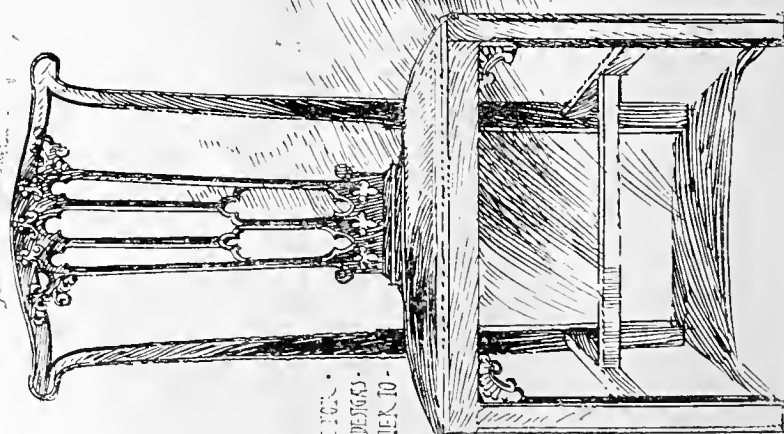
OLD WIEFELBACK ARM CHAIR



CARVED OAK (ABTNET)



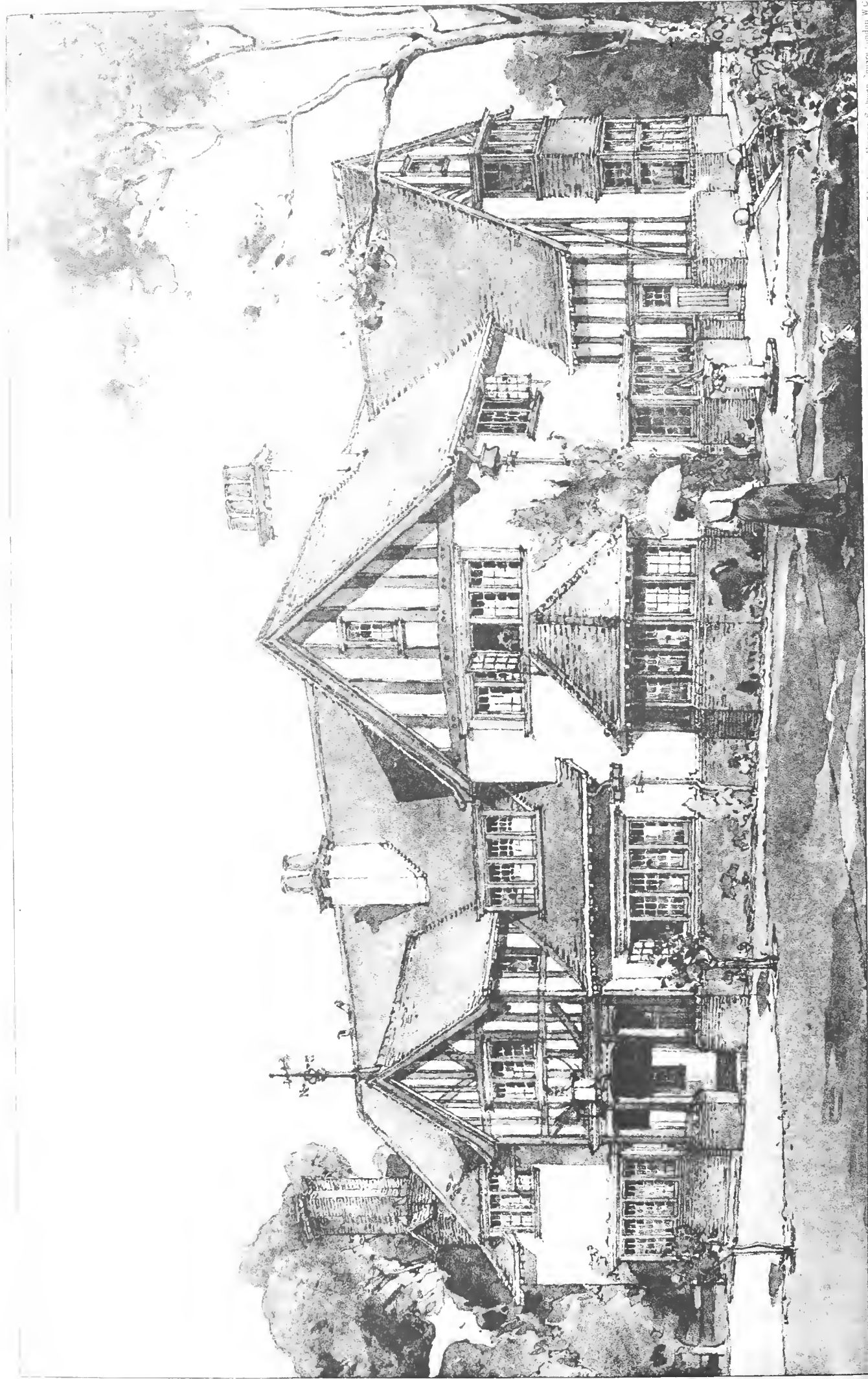
TWO STAFFORDSHIRE JUGS



GOTHIC (HIPPEYDALE (HAIR

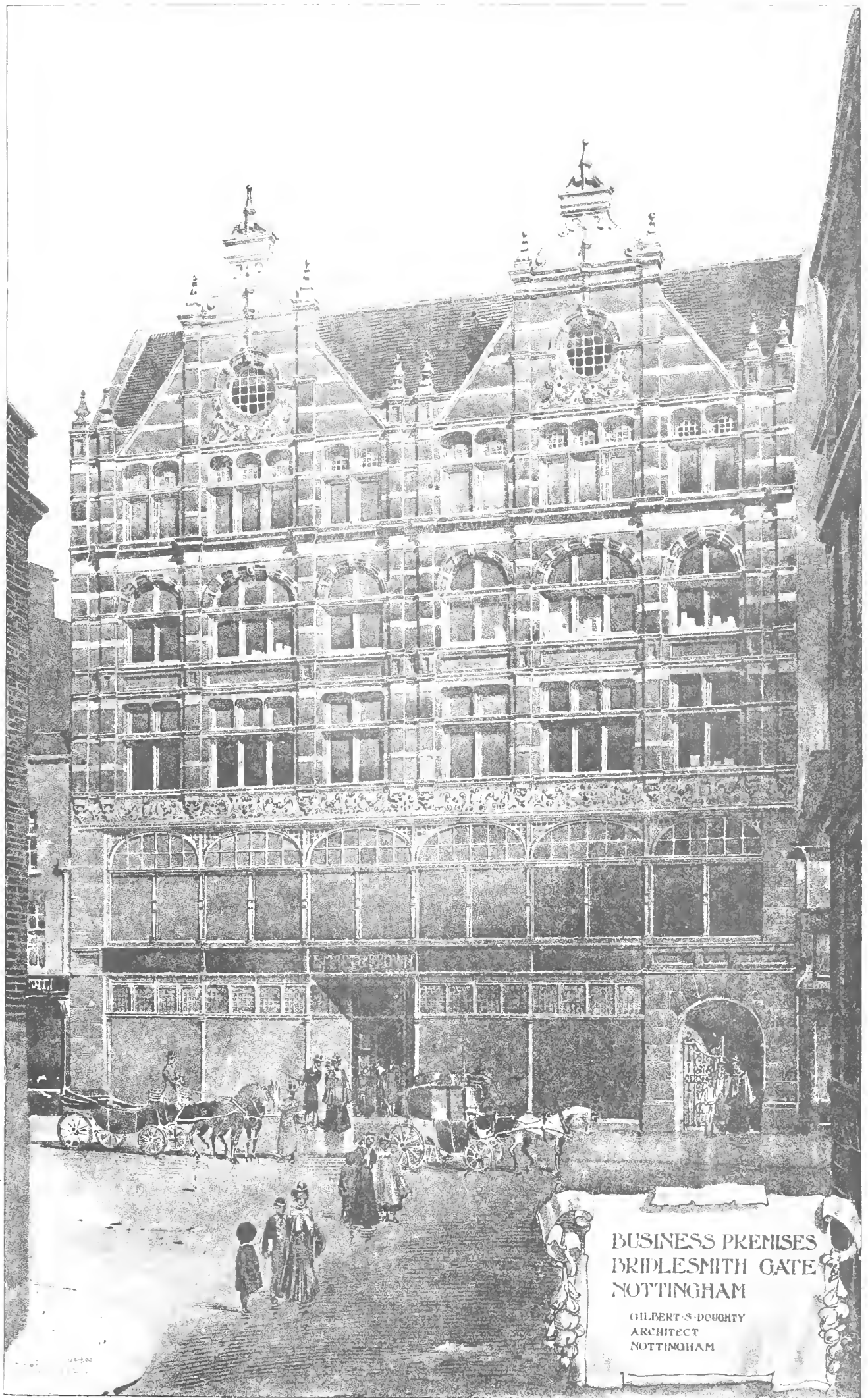
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 G. 2 OF THE FINEST DESIGNS.
 OF MANY DESIGNER TO-
 THE NEW,

The Building News, Dec. 4, 1903



HOUSE AT HATCH END · MELVILLE'S WARD FRIDA · ARCHT

"PHOTO TINT" by James Keenan & Queen Square London W.C.



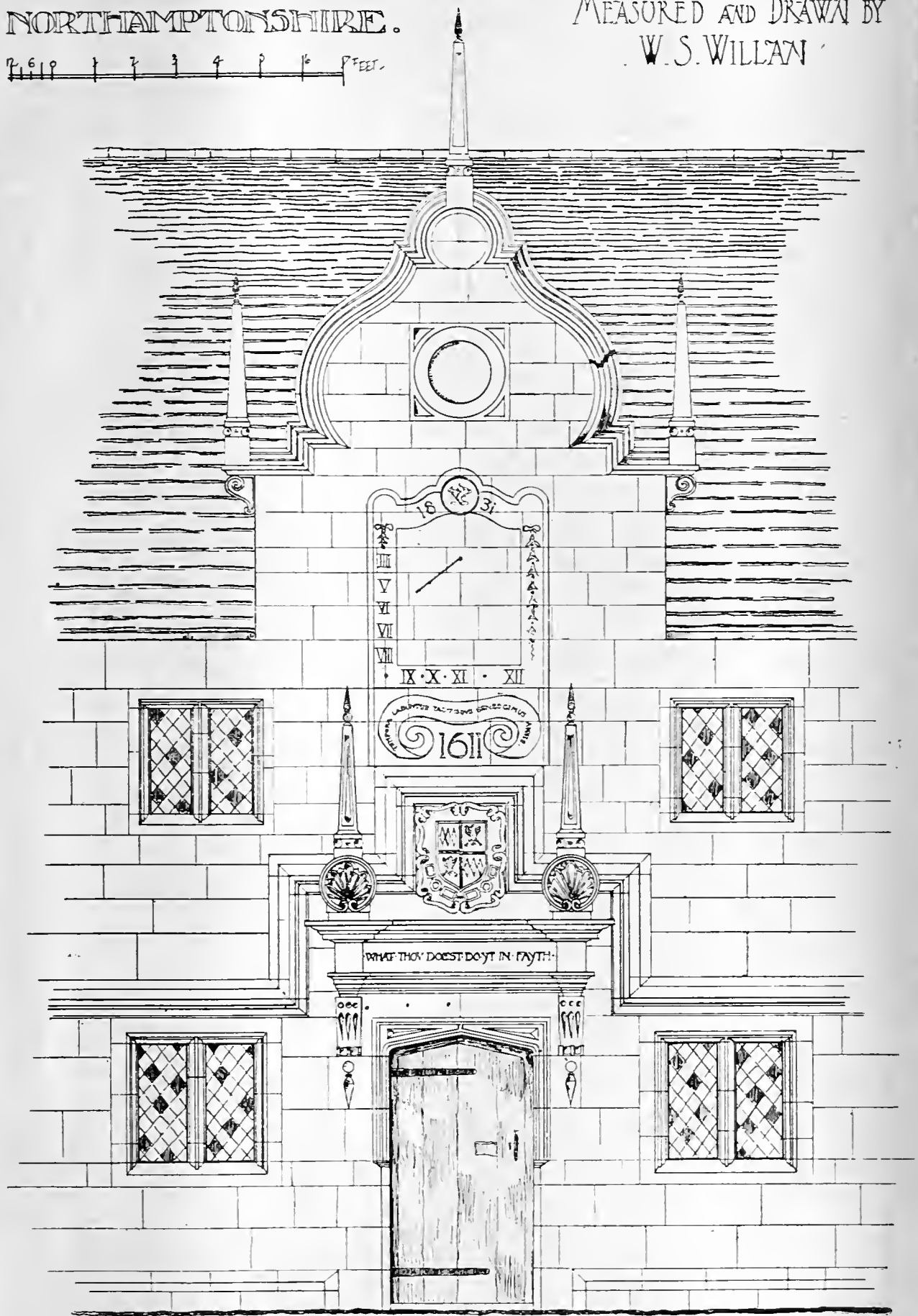
BUSINESS PREMISES
BRIDLESMITH GATE
NOTTINGHAM

GILBERT S. DOUGHTY
ARCHITECT
NOTTINGHAM

WEEKLEY HOSPITAL NORTHAMPTONSHIRE.

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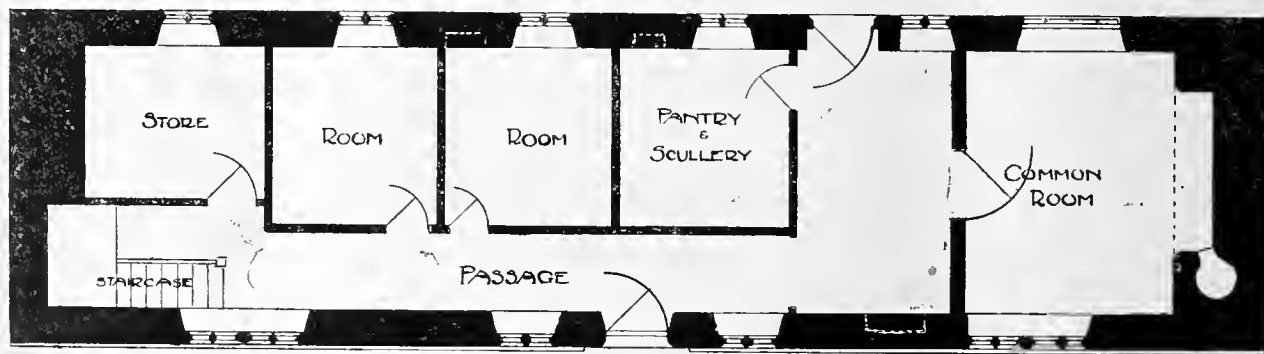
MEASURED AND DRAWN BY
W. S. WILLAN



FRONT ELEVATION.



· FRONT · ELEVATION ·



· PLAN ·

WEEKLEY HOSPITAL, NORTHAMPTONSHIRE.—Measured and Drawn by W. S. WILLAN.

WEEKLEY HOSPITAL.

WEEKLEY HOSPITAL was endowed in 1611 by Sir Edward Montagu, son of the Chief Justice, for the benefit of five poor men. It stands near to the entrance gates of Boughton House, one of the seats of the present Duke of Buccleuch, and the old seat of the Montagus. Above the door is the inscription "What thov doest do yt in faythe." It is still used as an almshouse. A sketch of the front of the almshouses, by Mr. M. B. Adams, appeared in the BUILDING NEWS for Feb. 12, 1892.

W. S. WILLAN.

· PROPOSED WELSH SCHOOL OF FORESTRY.

A CONFERENCE of Welsh county council representatives on the question of establishing a school of forestry for Wales and Monmouthshire was held at Haverfordwest last week. The movement, which was inaugurated by Mr. Edward Robinson, of Boncath, had secured the support of the county councils of Pembrokeshire, Glamorgan, Monmouthshire, Carmarthenshire, Cardiganshire, Breconshire, and Merionethshire. Sir Charles Phillips presided over the meeting. Mr. Robinson explained that the object was the planting of waste and at present unproductive

woodlands in Wales. A school could be established with 100 to 200 acres of land to start with, and the option of acquiring a further 500 or 800 acres, and the total capital outlay at the outset ought not to exceed £5,000 to £8,000, which could be contributed by the councils according to their rateable values. He believed the Government would contribute about half the amount required, and he assumed that an annual grant of £100 or less from each of the councils would be sufficient to cover all out-of-pocket expenses, and give a good return on capital. There were about a million acres of waste land in the Principality which could grow timber. Of the owners half might require assistance, and the planting would cost not more than £6 per acre. Spread over 30 years, that would require a yearly grant of £100,000 from the Government, the money to be repaid in that period by half-yearly instalments, and by the end of that time they should have plantations worth from £30,000,000 to £40,000,000. In the whole country there were 21 million acres of waste land, and quite eight millions suitable for planting, which in 50 years would be worth fully £650,000,000 sterling. At present we depended on foreign countries for our timber, whilst at least £8,000,000 per annum might be saved if our waste lands were properly afforested. He moved that it was desirable to establish a school of forestry for the whole of South Wales

and Monmouthshire. Mr. David Jones (Monmouth County Council) seconded. The chairman pointed out that under the Settled Lands Act money might be borrowed at £1 16s. 11d. per annum (principal and interest), spread over 40 years, for the improvement of land, subject to the control of the Board of Agriculture, and the planting of trees was included in the definition. The resolution was unanimously carried, and it was decided to hold a further conference at Swansea.

The Light Railway Commissioners are being applied to this week to sanction a line to Bradwell and Castleton, in the Peak District. The line will commence by a junction with the Midland Railway near Hope Station, and will be just under three miles in length. About four acres of land are to be acquired at Bradwell for a generating station and electric-car sheds.

The tower of the parish church of Wichnor was recently restored at a cost of £550, and dedicated to the memory of the late vicar. The dedication service was held last week.

The Bristol Tramways Company purpose applying for a provisional order to enable them to carry out certain extensions of their system increasing their mileage to forty. It is proposed to take powers to run to Mangotsfield, Hanham Abbots, Filton, Long Ashton, Westbury, and Henbury.

PROFESSIONAL AND TRADE SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of this association held on the 25th ult., a paper was read by Mr. David M. Nesbit, Leicester, on "Warming and Ventilation." Architects everywhere, said the lecturer, insisted inflexibly that the schools they were about to erect, the colleges and universities, the theatres, the places of worship, &c., should now and for the future be placed under the best hygienic conditions, and, more important still, that the hospitals for the sick and injured and all places devoted to the great science of healing should have unfailingly the essentials of pure air and an even, genial temperature. School buildings required special treatment, and he was sure that not less than 1,800 or 2,000c.ft. of air per hour should be given to each child in public schools, so as to insure the maintenance of a healthy atmosphere. Having urged the advantage of the plenum and vacuum systems, Mr. Nesbit referred to the cabinet system, an invention of his own, which he had called the "Copenumette," the novel feature of which was that a recess was built in the wall above the floor line, and the heating surface was fixed within. The whole of the apparatus was out of the reach of the occupants, and yet gave ready access for adjustment of heat and ventilation. It could be readily dealt with for repairs, could be kept scrupulously clean, and, in a word, it might be regarded as strictly hygienic. His desire for a wide adoption of the Cabinet arrangement was founded upon the vital necessity of cleanliness in the apparatus that directly conveyed air to the lungs. Warming and ventilation, he maintained, should go together. These matters as far as regarded churches and chapels had not in the past had the consideration needful; but he noted that those responsible for the health and comfort of their congregations were gradually overcoming the defects. He advocated the plenum system for public buildings, and pointed out that the overhead plenum system, to force the air downwards from above the ceilings, has already been carried out with successful results. The lecturer also spoke of the waste of steam traps, hot wells, &c., and showed how that waste could be prevented and economies obtained.

NORTHERN ARCHITECTURAL ASSOCIATION.—At a meeting of this association, held in Newcastle on Friday night, the Rev. Canon Savage, of South Shields, read a paper entitled "The Distinctively English Type of Church." Taking the subject from an historical point of view, he said he had two things in mind. First of all, he wanted to see what evidence they could get from English architecture as to the sources of religious life in England. Side by side with that he wished to bring out some points which showed the characteristic English national character. At the present time, the fashion was a sort of Little Englander fashion—to decry everything in English architecture. But he held that there had been a very distinctive national character in church buildings, right through—a sturdy common-sense character. That was no conglomerate—not a mixture of Celtic, Norman, French and German, and Italian and Byzantine, which all had differences. Canon Savage began with the Augustine Mission at Canterbury in 597, and the Northumbrian in 635. For forty years, in the Northumbrian Mission, there were nothing but wooden churches. Then they commenced to build in stone, the first churches being at Monkwearmouth and Jarrow. They got an entirely new type of church, with rectangular nave and chancel. The Northumbrian Mission spread all over England, and, with the exceptions of Brixworth and Wing, they had in all the churches over the whole country the rectangular east end. The western towers were probably refuge towers, and served a further purpose of being a lookout. This was characteristic of the period between the early Anglian and the Norman. From the prevalence of the Northumbrian form, they had evidence that it was from the Celtic mission and not from the Italian that this country got its conversion. The lecturer dealt with the influence of the Norman invasion, who put down everywhere their almost brutal form of architecture. There were beauties in Norman architecture, but the architecture generally was brutal, coarse, and heavy. Their idea of church government was strong monastic centres. But it was a curious thing that, within a century, the Norman apsidal churches had to give way to the normal national type of a rectangular east end. Then, from 1175 to 1195, they had the most rapid

development of architecture in all the centuries of the past. Thus they came to the distinctively Early English style, and here they had the strong assertion of the English restraining taste and common sense. At the end of the 12th and the beginning of the 13th century, all over the country, they had in almost every parish indications of church building. There was the uprising of the English as a nation. After that the style tended to become fantastical, in the Decorated period. Canon Savage brought his lecture down to the period from 1345 to 1355. The wars had broken down the power of chivalry, and gave the English a national life, and gave them the idea of a national army and navy. There was a great commercial development, and the Commons became the dominant partner, and the national life struck out in many ways. English was adopted as the national language; and there was the influence, also, of a black death. All this was translated into the church building, and they got developed the purely English type—the Perpendicular, which was the type of the plain, common-sense, average Englishman. So they got a complete preponderance of the Perpendicular everywhere except in Northumberland—partly because of the crushing influence of Durham Abbey and partly because of the fear of the Scotch. The Perpendicular style was the expression of free national life.

THE SOCIETY OF ARCHITECTS: CHANGE OF ADDRESS.—The Society of Architects has removed from St. James's Hall, Piccadilly, W., to its new premises in Staple Inn Buildings (South), Holborn, W.C. The new premises, built from plans by Messrs. Alfred Waterhouse and Sons, and illustrated in our issue of Aug. 14 last, adjoin Old Staple Inn, and are nearly opposite Gray's Inn-road. The second ordinary general meeting for the session 1903-4 will be held in the new premises on Thursday week, the 17th inst., at 8 p.m., when a discussion will take place on "A Bill to Amend the Law Relating to Ancient Lights."

CHIPS.

An order of adjudication has been made in the case of James Ellis, of Charlton, Kent, surveyor.

At a council meeting of the International Society of Sculptors, Painters, and Gravers, held on Dec. 2, Monsieur A. Rodin, the distinguished French sculptor, was elected president, in succession to the late Mr. James McNeill Whistler.

It is intended to remove the Catholic church now adjoining Prudhoe Hall, Northumberland, and to rebuild it at Prudhoe-on-Tyne. The church is a handsome building of stone throughout interior and exterior, complete with sacristies, tower, gallery, baptistery, chapels, and donor's vault, &c. The direction of this work is in the hands of Mr. Charles Walker, architect, Newcastle-on-Tyne.

The memorial to Sir Walter Besant, erected by his "grateful brethren in literature," will be unveiled in the crypt of St. Paul's Cathedral on Friday in next week, the 11th inst., at 3 p.m., by Lord Monkswell.

At a special meeting of the governors of the London Hospital, held on Wednesday, the House Committee reported that the rebuilding of the institution had now reached its last stages. The erection of a nurses' home at a cost of £10,000 had been begun, and Hebrew wards would be opened at an early date.

At a general meeting of the Society of Oil Painters, Piccadilly, held on Wednesday evening, the following were elected members:—Messrs. Charles Sims, H. Van der Weyden, E. Reginald Frampton, A. D. McCormick, Philip E. Stretton, and Miss Dorothea Landau.

A site for the erection of a statue to the late Mr. Quintin Hogg, founder and president of the Polytechnic Institute, Regent-street, has been granted in Oxford-circus.

The Earl of Aberdeen will open to-day (Friday) the extended premises of the Edinburgh Medical Missionary Society in the Cowgate of that city. They have been built from plans by Mr. T. P. Marwick, at a cost of over £5,000.

Lord Roberts has promised to unveil at no distant date the war memorial erected at the Jesuit College of St. Stanislaus, Beaumont, Old Windsor, in memory of the five old boys who lost their lives in the South African war. It is from designs by Mr. Gilbert Scott, who was educated at Beaumont College.

Mr. Robert McCallum, for many years on the engineering staff of the Department of Public Works of Ontario, has been appointed city architect of Toronto.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

Telegraphic Address:—"Timeserver, London."
Telephone No. 1633 Holborn.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., LI., LXI., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 6s. for four lines.

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Situations and Partnerships.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

J. WINTERBOTTOM.—The new War Office was illustrated in our issue of March 31, April 7, 14, and 28, 1899; and a further description appears in our number for Jan. 4, 1901, p. 7.

RECEIVED.—M. A. and Co.—W. P. H.—H. C. P. Co.—Tagliani.—M. and K.—B. D. H.

"BUILDING NEWS" DESIGNING CLUB.

THIRD LIST OF SUBJECTS.

A Clergy House, with a small hall for meetings incorporated in the building, which is to be located in a town slum street, on a site facing south, with a basement and a level frontage, 50ft. wide and 65ft. deep, the adjoining houses being shops below and lodgings above, with facades 45ft. high to top of parapets, their elevations being flush with the frontage line. The new building is to set back, so as to provide an area, with steps down to basement level; but a projecting wing or porch bay should be arranged, within the depth of which the steps to front entry are to be contained, the ground floor being 3ft. 6in. above the street level. The exact width of the area from back to front is left open for the competitors; but economy of space is essential. The area steps to be 3ft. wide. The elevation to be in red salt-glazed brick, with copings and strings of the same material. The casements to be metal, in stout wood-mullioned frames, painted white. Roofs tiled. The accommodation to furnish a hall on the ground floor, 50ft. long by 23ft. wide, having a small platform at one end, with a separate entrance from the house, the main door to the hall being from the clergy house vestibule. A parish priest's consulting-room must be placed on the other side of the same vestibule, and the hall of the house is to be beyond, where a good staircase, 4ft. wide in the going, is to lead up and down. The basement to contain a workshop for lads, 22ft. by 20ft.

deep, and a lavatory and w.c. for their use, isolated from the main building. The kitchen and offices in the basement. On the first floor, two sitting-rooms for the clergy, one being the refectory, fitted with a lift. There must be six small bedrooms for the clergy, one being somewhat larger (say 11ft. by 12ft.) for the vicar. There must be two bath-rooms, a lavatory, and two w.c.'s for the clergy's use. These bedrooms may be partly on the first floor and on the second floor. On the third floor two rooms for the servants with a small private staircase for their use, right up from basement, where their bath-room and closet may be situated, though this position is optional. There is no light available from either side of the site, and no approach from the back; but light can be had from the rear, where there is an open churchyard. The hall is to be 15ft. high. The ground-floor and first-floor rooms 11ft. high, other rooms 9ft. 6in., and in the basement 13ft. high from floors to ceilings. Two elevations, one section, and plan of each floor. Scale 5ft. to the inch for elevations, but the plans may be one-sixteenth of an inch scale if space is limited. A sketch view is desirable. Drawings to be received on Jan. 2, 1904.

DRAWINGS RECEIVED.—Ninety-one designs were received for the Solicitor's House:—"Spero," "Yew Tree," "Last Man In," "Val," "Frouge," "Frena," "An Old Scholar," "Auto-Car," "Vulcan," "Cris-Cross," "Marquis," "Bucolic," "Norseman," "Seasider," "Bill," "Cledadyn," "Tajus," "Kingston," "Imprimatur," "Zigzag," "Jap," "Arabitan," "Lex," "Laverock," "Dingle," "Wee McGregor," "Ionic," "Obelisk," "Friar Tuck," "Shine," "The Magpie," "Six-and-Eightpence," "Leofric," "A Scot," "Cast," "Alpha," "Regent," "Primus," "Vectis," "Gayville," "D'Artagnan," "By Pen," "Detur-Digniori," "Tryfan," "Marcus," "Try," "Puck," "Kangaroo," "Tenderfoot," "Vale-o-Lane," "Sam," "Eurymedon," "Pan," "Mich," "Legal," "Orchid," "Jacobean," "Mr. Dooley," "The New boy," "Leo," "Architect," "Wee McGregor" (Galashields), "Adze," "Tyne" (much too large a sheet; see rules, or you will be excluded), "Saucy," "Cave," "Canen," "Knight," "Novocastria," "Cadric," "Ghost," "Marksmen," "Black Heart," "Jacobean," "Halifax," "Pip," "Jingo," "St. Nicholas," "Liver" (your name and address cannot be read. Learn to write plainly), "Consul," "Loidis," "Plumb-bob," "Lyric," "Inside Right," "Croesus," "Tree Square," "Quatre Vois," "Opportunity," "The Kid," "O. B.," "Omega," and "Old Mercer" (very late).

"O. K." omitted to give his name and address, therefore his drawings cannot be returned.

Correspondence.

BRIGHTON HOSPITAL FOR WOMEN COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—As a competitor, I wish to call your attention to the extraordinary proceeding in connection with the above competition. Shortly after the designs were sent in an invitation was issued by the committee inviting competitors and the general public to an at-home to inspect the designs; but a few hours before that function the competitors received a notice informing them that they (the competitors) would not be allowed to attend.

The award was eventually made, and we have now received a notice that we shall only be allowed to inspect the selected designs.

Was not this an extraordinary way of treating the competitors? Surely competitors, after spending so much time and money, should have been placed on the same footing as the general public? I really think the committee ought to have given them an opportunity of inspecting the whole of the drawings, so that a full comparison might have been made, thus enabling them to benefit by any salient points that might have struck their notice in any one of the designs.—I am, &c.

COMPETITOR.

ARCHITECT'S SECRET COMMISSIONS.

SIR,—I concur with your correspondent "F.R.I.B.A." in your last issue, that the above subject is the one above all others requiring the urgent attention of the R.I.B.A. It is not enough, in my opinion, that members should sign agreeing to the charter and by-laws, which distinctly prohibits secret payments of any sort, for I know members of the Institute who do not hesitate to accept these degrading commissions in various ways, which does more harm to the profession than can be calculated. As "F.R.I.B.A." says, the architect who stoops to such dishonest practices cannot do justice to his client, nor does he command the respect of either contractor or tradesman from whom he receives his illegitimate commissions.

I had occasion some years ago to commence a correspondence in the *Irish Builder* on this subject, for there I found one or two instances where matters had gone much further than anything I had come across on this side of the water. I think that every architect desirous of upholding

the status of the profession ought to impress it upon all his pupils and assistants what a degrading and lowering practice it is. How I wish it could become one of the subjects of the R.I.B.A. examinations, and how much more do I wish to see every member of the Institute who lowers himself to such an extent be disgraced by expulsion from membership! Is it possible to have a committee of members to collect any information they can, and, after exhaustive inquiries, press for action to be taken under the charter and rules of the Institute? Again, this is an appropriate time to mention another point, Christmas being close at hand, and that is the acceptance of Christmas gifts from contractors and tradesmen. How many of them would be only too glad if all architects would signify their disapproval. It only wants doing once: by making a rule, as I have done, to return same without any offence whatever.

I believe that accepting illegitimate commissions is even a more important subject to be brought before Parliament to be made a criminal act than is the passing of the Architects' Registration Bill.—I am, &c.,

WILLIAM R. GLEAVE, A.R.I.B.A.
18, Low-pavement, Nottingham.

INCREASE YOUR INCOMES?

SIR,—I inclose an advertisement taken from your contemporary the *Builder*, with the reply thereto, hoping by making it public you will save architectural draughtsmen the humiliation of answering it should it appear in your journal.—I am, &c., J. E. R.

ARCHITECT'S Managing Assistant required. Architect's assistants can add materially to their income in a legitimate manner, with little trouble and no pecuniary outlay. Particulars, address Architect, care of—.

[COPY OF REPLY.]

DEAR SIR,—In reply to your inquiry as to my advertisement in the *Builder*, it has probably occurred in your experience, as it has in mine, that an architect of your acquaintance, and possibly your employer, may have at some time (from press of business, or other causes) required the services of a quantity surveyor, other than the one usually employed, in the preparation of quantities, measured accounts, &c. If you know of any such architect now requiring, or likely to require, the services of a surveyor, and you are instrumental in introducing the work, either directly or indirectly, I should be pleased to share with you the bonus I usually receive from a well-known and fully-qualified London quantity surveyor on the introduction of work. When this gentleman's name is given, there will be no question as to abilities, position, &c.

The terms of the quantity surveyor, whose name I shall give you, are most reasonable, and for, say, a £10,000 job, you would get about £20, part of it at once, and the architect whom you introduce would also effect a considerable saving.

Having benefited myself in the manner indicated amongst my more immediate acquaintances, I naturally concluded that the advantages might be extended by making it more generally known (but, still, the number will be strictly limited), consequently my advertisement.

On hearing from you in reply, whether or not you are of opinion that you could introduce business, either now or in the near future, I should be pleased to furnish you with further particulars and copy of memo of proposed agreement between us. In this agreement it may be arranged that the bonus come through you instead of me if preferred. All communications will be treated as strictly private and confidential.—Yours truly,

Intercommunication.

QUESTIONS.

[12028].—**Chalk Gravel.**—Can any reader name a district in the south of London, within 20 miles of St. Paul's, which is undoubtedly either chalk or gravel soil? I mean, where the whole neighbourhood is of one of those formations, so that in selecting a house one can be sure it is on a pervious soil.—R. A. R.

REPLIES.

[12024].—**Rainwater.**—Thanks to "E." for answer. Could not slate tank be fixed outside scullery to catch and filter water to be used for all purposes, so as to do away with necessity for force-pump?—A. B.

A Benevolent Association in connection with the Furnishing and Allied Trades has recently been formed. The inaugural dinner is to be held at the Criterion Restaurant on Dec. 5, when an appeal is to be made for the sum of £20,000, necessary to acquire and erect the proposed Furniture Trades' Colony, at Radlett, Hertfordshire.

New co-operative stores at Birtley, Co. Durham, were opened on Saturday. The premises have cost £23,000, and have been carried out by the society's own building department, from plans by Messrs. Liddle and Brown, architects, of Newcastle-on-Tyne.

LEGAL INTELLIGENCE.

A WESTON-SUPER-MARE ARBITRATION.—The award has now been published of the umpire (Mr. Charles Wainwright, F.S.I.) in an arbitration case, in which the Weston-super-Mare Gas Company offered Mr. Blackmore £700 for 2½ acres of land at the rear of the gasworks, which the company were acquiring under their compulsory powers. The umpire awards Mr. Blackmore £1,369, and this involves the payment by the company of all the costs, amounting, in view of the length of the proceedings, to a very large sum.

LONDON WATER ARBITRATION.—At the sitting, on Friday, the Court gave a decision that the sum claimed for land tax was a payment on behalf of shareholders, and recoverable from them by the company. Evidence was given by Lord Rothschild and other witnesses as to the probable value of Water Board stock; and, in regard to the liability of the companies interested in the Staines Reservoirs to contribute to the sinking fund, the Court held that, as no water had yet been obtained from the reservoirs, the companies were not at present liable. On Monday the Court further decided that the profits of the Clerkenwell estate of the New River Company are to be treated as part of the profits of the undertaking. This decision will materially reduce the amount of the compensation to be ultimately awarded. Further evidence was given as to the condition of the Staines works, and it was intimated that Sir J. Wolfe Barry, one of the arbitrators, would visit the works. The Court also announced that they found that 13 of the 54 landed properties of the New River Company were part of the undertaking, and the rest were not. It appeared that the limitation of the company's dividend to 10 per cent., if upheld by the House of Lords, would reduce the claim to £8,214,163. Argument took place on a claim for £396,255 for directors' remuneration in perpetuity, and the Court held that the directors' fees formed part of the working expenses of the company, and must be deducted from the dividend. This reduces the amended claim by £396,255.

STATUES, MEMORIALS, &c.

EDINBURGH.—The memorial erected in St. Giles Cathedral to the memory of the officers and men of the Royal Scots Regiment who lost their lives during the Boer War was unveiled on Wednesday by Lord Rosebery. It takes the form of a mural tablet, 8ft. 9in. by 7ft., the principal feature of which is a bronze central panel, 5ft. 3in. by 3ft., in which is depicted in high relief the scene of one of the regiment's engagements in South Africa. A party is engaged in storming a rocky kopje, which rears itself in pyramidal form about the centre of the panel. In the foreground is an officer leading on his men. Soldiers are storming the heights, each man trusting more or less to his own initiative. On the left corner lies a wounded Boer, not far from him is a British soldier assisting a wounded comrade, and on the right front one who lies stiff in death. Away on the left, past the kopje, is seen a glimpse of a far-stretching plain, and in the distance a range of hills with characteristic flat tops. This figure-panel is framed by pilasters of grey-green Cippolini marble, with Ionic columns. These pilasters abut again on upright tables, on which are inscribed the names of the officers and men who laid down their lives for King and country. At the top of each of these tables is the badge of the regiment—the Star of the Order of the Thistle—in bronze, with the Imperial crown. Surmounting the memorial is a pediment-shaped slab, having upon it in high relief in bronze a winged figure of "Glory," holding in her right hand a laurel wreath and in the other the trumpet of fame and a spray of laurel. The memorial was designed and executed by Mr. W. Birnie Rhind, A.R.S.A., the architectural details being carried out by Mr. T. D. Rhind, A.R.I.B.A.

WATER SUPPLY AND SANITARY MATTERS.

RESERVOIR NEAR GREENFIELD.—Plans and specifications are being prepared for the construction of a large reservoir in the Chew Valley, Greenfield. It will be called the Chew Reservoir, and will have a holding capacity of well over 100,000,000 gallons. It will be on a higher level than any of the reservoirs owned by the Ashton, Stalybridge, and Dukinfield Joint Waterworks Committee, and will be able to supply the very highest situated houses within the district supplied by that committee.

An exhibition of art applied to manufactures is being held this week in the Shire Hall, Chelmsford, closing to-morrow (Saturday). The objects are to stimulate the application of art to manufactures amongst all sections of the community; to show the results produced by the students of the Chelmsford Art Classes; and to raise funds towards the equipment and fittings of the Chelmsford New Art Buildings.

Our Office Table.

At the last meeting of the Society of Antiquaries a paper, illustrated by lantern views, was read by Mr. Philip Norman, treasurer of the society, on the "Roman Wall of the City of London at Newgate." To show the general direction of the Roman wall, Agas's map of about the end of the 16th century was exhibited, and with it a tracing from a recent map, from which the course of the wall and Medieval gates could be made out. In the middle ages the City authorities utilised the Roman wall for defence, raising it by the addition of a parapet. An analogous case of adaptation was to be seen in the bastion at Cripplegate Churchyard. Mr. Norman dealt chiefly with a piece of the old wall, about 20ft. long, which was uncovered in October, and was now gradually being cleared away. He described the structure of the wall from the foundation of puddled clay upwards, dealing with the courses on the inner and outer faces, and the bonding tiles, with the rubble filling between the two surfaces. The wall was 9ft. in height, of about the same thickness, and the top some 18in. below the level of Newgate-street. The south-west corner of the 17th century gateway was then shown. In its foundation fragments of Kentish rag, similar to the material of the wall, and tiles were discovered; and there was also found a chamfered plinth which had formed part of a Roman building, and this, Mr. Norman said, was the only portion of a Roman gateway which had yet been met with. Blocks of stone, fragments of mortar, and pieces of the plinth clamped together with iron were exhibited at the meeting. The small Roman remains met with during the progress of the works have been deposited at the Guildhall Museum.

The School of Applied Art at Edinburgh, which was recently taken over and is now conducted by the Scottish Board of Manufactures, has on view the exhibition of drawings by the architectural pupils, which will be open till the end of next week in the R.S.A. galleries at Edinburgh. The art survey undertaken by senior students during the holidays, at the instance of the school, embraces drawings of details of such interesting old buildings as Dryburgh, Jedburgh, and Melrose Abbeys, Rosslyn Chapel, Leuchars Church, Pinkie House, &c., and these, which become the property of the school, will be added to a collection which has now assumed quite a national character. The work by the outdoor sketching classes is varied, and makes an excellent show. The travelling bursars' work also commends itself by its care and thoroughness. Both bursars, Mr. A. Ednie and Mr. John Morton, are decorative artists rather than architects, and of their drawings the former includes reproductions of French furniture and decorations from examples in South Kensington, and the latter studies of cabinets and other pieces of furniture. Examples of school colour studies are also on the walls. The principal architectural teacher at present is Mr. Greig.

REINFORCED concrete tubular flooring of a new design has recently been patented and put on the market by an architect named Siegwart, of Lucerne, which is described in a report of the American Consul H. H. Morgan. The floor is essentially a combination of beams, floor, and ceiling in separate rectangular tubes from about 3½in. to 8½in. deep, 10in. wide, and 18ft. to 25ft. long. The tubes are now being manufactured in Switzerland, Italy, Germany, and Russia in factories. Moulds containing a collapsible cylindrical iron core are filled with mortar made of one part cement and four parts coarse sand. Each mould contains six ½in. to ¾in. steel rods, part of which are in the lower flange and part are bent upwards. After the cement has set, the moulds are collapsed by a screw device and are withdrawn, the beams being cut to length by a machine before they are hard. They are shipped as required to the buildings, and laid on the floor-girders to form a continuous surface like a heavy plank deck. The report states that they are now being used in all buildings at present under construction in Lucerne, and mentions seven factories outside of Switzerland in which they are manufactured.

SOME old parish books have recently been recovered by Earl Nelson and handed over for safe custody to the rector of Burnham Thorpe. The books, which were evidently stolen from the

parish chest many years ago, are especially interesting because of their association with the Nelson family, their date being at the period when the father of the Admiral was rector, many of the entries being signed by him. They turned up at a London auction a month or two ago, and were purchased by a dealer in genealogical curiosities, who promptly communicated the fact to the present Lord Nelson. We keep these things in safer custody now than was often the rule a few generations ago, and the old books, having got back to their parish chest, are not likely to be spirited away again. As Lord Nelson remarks in his letter to Mr. Briscoe, "They were not so particular in those days."

A NOTICE to owners and masters of British and foreign vessels relating to the carriage of deck cargoes of light wood goods during winter has been issued by the Board of Trade setting forth more clearly the kinds of timber permitted, and to what extent in height, upon the deck, and also the kinds of timber absolutely prohibited from being carried. Questions having arisen with reference to the interpretation to be placed upon the words "light wood goods," the Board of Trade acquaint shipowners and shipmasters concerned that they have informed their surveyors that they are willing to regard as "light wood goods" analogous to deals any goods of "light wood" the units of which are of no greater capacity than 15c.ft. All goods of light wood, the units of which are of greater cubic capacity, must be deemed to be "timber" within the meaning of sub-section 3 (a) of section 451 of the Merchant Shipping Act, 1894, which states that for the purposes of this section the expression "wood goods" means any square, round, waney, or other timber, or any pitch-pine, mahogany, oak, teak, or other heavy wood goods whatever; or any more than five spare spars, or store spars, whether or not made, dressed, and finally prepared for use, or any deals, battens, or other light wood goods of any description to a height exceeding 3ft. above the deck. The girth of all round timber is to be measured by string, and that of square timber by callipers. Any goods of pitch-pine, mahogany, oak, or other heavy wood, be the pieces ever so small, are absolutely prohibited from being carried on the deck of a ship arriving at a port in the United Kingdom between the last day of October and the 16th day of April.

THE eleventh annual examination in Sanitary Building Construction promoted by the Carpenters' Company was held at Carpenters' Hall on Thursday in last week. The candidates were representative of the United Kingdom, while one came from Hong Kong. If the candidate is successful, he will be the third member of the sanitary staff at Hong Kong holding the certificate of the company. The examiners included Professor Henry Robinson (King's College), Dr. Wynter Blyth (medical officer of Marylebone), Mr. Bartlett, Mr. John Slater, V.P.R.I.B.A., and Mr. Wilson. In addition the presidents of the Institute of Builders, the Institute of Civil Engineers, and the Royal Institute of British Architects were invited to join the examining body. The *visa voce* examination was held on Saturday afternoon.

THE full list of plans deposited in connection with Private Bills in promotion for the ensuing session of 1904 was issued on Thursday. The total is 272, as compared with 294 deposits for the Session of 1903. The applications of special interest to London and its vicinity include:—Baker Street and Waterloo Railway; Charing Cross, Euston, and Hampstead Railway; Great Eastern Railway (General Powers); Great Northern Railway; Isle of Thanet Light Railways; London and North-Western Railways; London, Tilbury, and Southend Railway; Metropolitan District Railway; North and South Woolwich Electric Railway; Harrow Road and Paddington Tramway; London County Council (Tramways and Improvements); London, Camberwell, and Dulwich Tramway; London United Tramways (Railways); Romford and District Tramway; Basingstoke Corporation; Bexhill Corporation; Bournemouth Corporation; Corporation of London (Southwark and other Bridges); Ealing Corporation; East London and Lower Thames Electric Power; Great Yarmouth Corporation; Ilford Urban District Council; Leyton Urban District Council; London County Council (General Powers); Naval Works (Portsmouth Barracks site); and Post Office Sites Bill, 1904.

NOTIFICATION is given of an intended applica-

tion to Parliament next session by the president, vice-presidents, and governors of King's College Hospital for leave to bring in a Bill authorising them and the committee of management to sell, lease, and otherwise dispose of the hospital and site. The Bill will contain clauses providing, *inter alia*, that upon any sale, letting, &c., of the chapel erected in the hospital, or any other portion of the site which shall have been consecrated as a burial-ground, the chapel and any part of the site so consecrated shall vest in the purchaser, &c., freed from all disabilities and restrictions; authorising the president, &c., and the committee to make agreements with persons having interests in the lands, &c., forming part of the site for the acquisition by the former of such interests; and empowering them to purchase, lease, &c., any lands, &c., suitable or convenient for a hospital, "and to erect and maintain on such lands or any of them a hospital, with all buildings and appurtenances which may be deemed necessary or desirable for the purposes of such hospital, and a medical college connected therewith."

At a meeting of British sculptors held in London on Saturday night, Mr. George Frampton in the chair, a proposal to form a society of sculptors was agreed to. Nearly fifty sculptors were present. The objects of the society will be to put more power behind the back of sculptors whose copyright has been infringed or who have similar legal grievances, to demand less inconvenient and expensive conditions in the competitions for which private sculptors are invited to tender work, to make it clear that sculptors are not satisfied with the off-hand treatment they receive at most public galleries, and perhaps ultimately to hold exhibitions.

MR. ROBERT BOYLE, the well-known engineer, sends us an extract from the Vienna *Faterland*, which publishes an interview with the Pope, who said:—"They say I am turned into a Grand Seigneur, because by my order two apartments were prepared for me. Now, it is true that Leo XIII. was content to live, for twenty-five years, in one small room, in which he slept, dined, and worked; but I cannot understand how he was able to do it. I need an airy, roomy apartment. But above all I must have air." That is gospel, if the arch-fiend had said it. Coming as it does from a great ecclesiastic whose words are received with veneration by one great section of Christians, and by all others with the respectful consideration due to so eminent and lovable a character, we can only hope it may quicken the crusade against the evil of all evils that saps the vitality of civilised mankind.

GEORGE TROLLOPE AND SONS AND COLLS AND SONS (LIMITED) is a new company, with a capital of £450,000, divided into 20,000 Five-and-a-Half per Cent. Cumulative Preference and 25,000 Ordinary shares of £10 each. The Ordinary share capital (except £3,000 taken up by the directors) has been taken by the vendors in part payment of the purchase-money, and Messrs. C. J. Hambro and Son invite subscriptions for the Preference shares. It is not intended to issue any debentures or debenture stock. The company has been formed to purchase and amalgamate the building businesses of Messrs. George Trollope and Sons and Messrs. Colls and Sons. The businesses will be taken over by the company as going concerns as from December 31, 1902. The purchase price has been fixed at £400,000, of which £93,000 is payable for the goodwill of Messrs. George Trollope and Sons' business and £70,940 for the goodwill of Mr. Colls's business. The purchase price is payable as to £247,000, which includes the amount of such goodwill, in Ordinary shares, and as to £153,000 in cash.

A Volunteer drill-hall, erected at a cost of £1,100, was opened on Saturday at Nunenton by General Sir John Ardagh.

A Local Government Board inquiry was held on Thursday in last week at the Barton Court Hotel, New Milton, into the scheme for the sewage of that part of the district. Mr. H. Tulloch conducted the inquiry. Mr. Rollings, town clerk of Lymington, appeared on behalf of the rural district council, and Mr. Shenton, the engineer, in support of the scheme, which was opposed by several of the landowners in the district. Evidence against the scheme was given by Mr. Blizard, C.E., of Southampton.

The additions to the Wilts County Asylum, Devizes, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

LIST OF COMPETITIONS OPEN.

Elgin—School (340 places)	Hugh Stewart, Clerk, Elgin	Dec. 7
Selly Oak—Public Baths (Assessor)	A. W. Cross, A.M.I.C.E., 23, Valentine-road, King's Heath	" 7
Clare, Suffolk—Water Supply Scheme (population 1,582)	J. Bigmore, Clerk, 24, Queen-street, Haverhill, Suffolk	" 10
Herne Hill, S.E.—Public Library	H. J. Smith, Clerk, Lambeth Town Hall, Kennington Green, S.E.	" 16
Aylesford—Single-Span Stone Bridge over Medway (Assessor)	The Town Clerk, Maidstone	Jan. 1
Windsor—Elevations for Police and Fire Brigade Stations	E. A. Stickland, A.M.I.C.E., Borough Surveyor, Windsor	" 15
Wakefield—Free Library	Chas. Jas. Hudson, Town Clerk, Town Hall, Wakefield	" 20
Erdington—Council House and Free Library (Wm Henman, F.R.I.B.A., Assessor)	£50, £30, £20	Herbert H. Humphries, Eng., Public Hall, Erdington, Birmingham Feb. 1
Vienna—Machinery to Lift Bosta	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Con.-Gen, 22, Laurence-Pounteney-lane, E.C. Mar. 31
Fraserburgh—Infectious Diseases Hospital and Public Library	William Alexander, Burgh Surveyor, Fraserburgh	—
Rhyl—Pavilion (10,000 places) at National Eisteddfod	H. A. Tlby and J. W. Jones, Gen. Secs., Town Hall, Rhyl	—
Torquay—Carnegie Public Library and Municipal Buildings, Upton Valley (Assessor)	5'gs., 30'gs.	Fredk. S. Hex, Town Clerk, Town Hall, Torquay

LIST OF TENDERS OPEN.

BUILDINGS.

Nottingham—Minor Repairs in Elementary Schools (One Year)	Education Committee	W. J. Abel, Clerk, Nottingham	Dec. 5
Roche, Cornwall—Cattle House, &c.	Abel Searle	George Gow, Tregothnan Office, Truro	" 5
Sesforth, Sussex—Mortuary	Urban District Council	W. H. Pawson, Clerk, 3, Clinton-place, Seaford, Sussex	" 5
Deal—Rebuilding Five Ringers Inn	Guardians	W. J. Jennings and J. F. Duthoit, Archts., Dover and Canterbury	" 5
Croydon—Relief Station, Sanderstead-road	Hedworth, Monkton, & Jarro S.B.	Wills and Anderson, Architects, 4, Adam-street, Adelphi, W.C.	" 7
Jarrow—Additions to Dunn-street School	Corporation	T. H. Spencer, Clerk, Jarrow	" 7
Buckie—House and Chapel	Craven Bank, Ltd.	A. Tod Brown, C.E., 12, Low-street, Buckie, Scotland	" 7
Clonmel—Artisans' and Labourers' Dwellings	Co-operative Society	James J. McAuley, Architect, Clonmel	" 7
Bingley, Yorks—Branch Bank and House	Standing Joint Committee	R. Armistead, Architect, 8, Charles-street, Bradford	" 7
Ynysybwl—Bakehouse	Guardians	D. Dalis Jones, Secretary, 45, Robert-street, Ynysybwl, Wales	" 7
Berwick-on-Tweed—Rebuilding House and Shop, High-st.	Co-operative Society	W. Gray, Architect, 2, Ivy-place, Berwick-on-Tweed	" 7
Wokingham—Police-Station	Urban District Council	Jos. Morris, County Surveyor, Broadways Buildings, Reading	" 7
Croydon—Relief Station, Church-road	Urban District Council	Wills and Anderson, Architects, 4, Adam-street, Adelphi, W.C.	" 7
Ynysybwl—Bakehouse	Urban District Council	D. Dalis Jones, Secretary, 45, Robert-street, Ynysybwl, Wales	" 7
Bradford—House and Shop	Urban District Council	J. W. C. Atkinson, Architect, 1, Ivegate, Bradford	" 8
Cleethorpes—Fire Station	Urban District Council	Egbert Rushton, Engineer, Poplar-road, Cleethorpes, Lincs	" 8
Herne Bay—Alterations to Town Hall	Urban District Council	F. W. J. Palmer, Surveyor, Town Hall, Herne Bay	" 8
Bradford—Three Houses	Urban District Council	J. W. C. Atkinson, Architect, 1, Ivegate, Bradford	" 8
Glasgow—Five Cottages at Provan Gasworks	Urban District Council	Alexander Wilson, Engineer, 45, John-street, Glasgow	" 8
Keighley—Additions to Union Infirmary	Urban District Council	Moore and Crabtree, Architects, York Chambers, Keighley	" 8
Milford Haven—Laboratory at County School	Urban District Council	W. J. Wood and J. B. Gaskell, Architects, Milford Haven	" 9
Barrow-in-Furness—Additions to Cart-Shed	Urban District Council	The Borough Engineer, Barrow-in-Furness	" 9
Haltwhistle—Boardroom	Urban District Council	John M. Clark, F.S.I., Surveyor, Haltwhistle	" 9
Birdwell, Yorks—Six Houses	Urban District Council	P. A. Hinchliffe, Architect, 14, Regent-street, Barnsley	" 9
Belton—House and Farm Buildings	Urban District Council	Henry Kelsey, Architect, Queen-street, Epworth	" 10
Bingley, Yorks—Villas, Bromley-road	Urban District Council	W. Rhodes Nunn, Architect, Bugley, Yorks	" 10
Lurgan—Post-Office	Urban District Council	W. H. Stephens and Son, 13, Donegall-square North, Belfast	" 11
Norwood, S.E.—Nine Shops, Norwood-road	Urban District Council	Albert L. Guy, Architect, 4, Verulam Buildings, Gray's Inn, W.C.	" 11
Queenborough—Coastguard Station	Urban District Council	The Director of Works Dept., 21, Northumberland-avenue, W.C.	" 11
Peterborough—Extension of Post Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	" 11
Wootley—U.M.F. Church Sunday School	Urban District Council	C. Fredk. Wilkinson, Architect, 35, Park-square, Leeds	" 12
Manchester—Abattoirs, Tack-street	Urban District Council	The City Architect, Town Hall, Manchester	" 11
Gallows Plain—Alterations, &c., at Isolation Hospital	Urban District Council	W. Leonard Grant, Architect, Sittingbourne	" 11
Littlethampton—Coastguard Station	Urban District Council	The Director of Works Dept., 21, Northumberland-avenue, W.C.	" 11

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IMPROVED TYPES OF BUILDING.

PROBABLY one of the most instructive and interesting aspects of architecture as an art of evolution is the development of the many types of modern buildings, which are of such practical concern to the architect. All through the ages the specialisation of structure to meet the requirements of the time is a study of much value as it corroborates the law of "natural selection" in one department of industry. We do not address ourselves to this wider view of the theme, though it is one that ought to be made an important topic in connection with architectural education, but to the more practical lessons for the architect. He ought to give the subject more consideration by trying to discover those points of departure which make for progress where the old and new part company, or the "parting of the ways" begin, instead of trying to obscure or reconcile them. There is some particular direction of change in certain buildings. In the domestic dwelling, perhaps, the changes to be noticed are very small. The same ideas of home convenience and comfort exist as they did a century ago; but there are changes in habits of life, and these are varied in both town and country. To take the ordinary town house, the chief change will be seen in the provision of more rooms, billiard-rooms and conservatories, a better equipped suite of domestic offices, less large and rambling but more convenient, lavatories and bathrooms on the upper floors, better and more sanitary servants' bedrooms. In the planning and decoration of the chief reception-rooms and bedrooms we have lately reverted to old models, and the direction of change has rather been in the introduction of modern methods of heating and ventilation and sanitary appliances, which have not very materially altered the type of house. The country residence, perhaps, shows less development in these directions. The owner's taste is the main consideration. If he is social the reception-rooms are made a feature; if studious or of a literary turn, or of sporting tastes the drawing-room and its accompanying rooms may be sacrificed to the library or the gunroom. If there is any development of planning it is rather in the direction of the kitchen offices and their more sanitary arrangement round a court. In the smaller town dwellings, owing to the value of land, the tendency is to compress the requirements, to make the living-rooms small, and to reduce the area of kitchen offices and means of communication, such as passages and staircases. The typical suburban house in a row, semi-detached, is well known, with its front block of living-rooms and the projecting offices at the back extending into the garden in the rear. It is desirable that the architect take stock of these tendencies of present-day house-building, so that he may be able to direct his attention to those points of plan and design which are liable to be modified or are capable of improvement. The relation of entrance-hall to the several reception-rooms and staircase, the planning of kitchen and domestic offices in the most economical way with regard to their connection with the dining-room, direct communication, sanitary provision, and fire-resisting arrangements, are a few of the subjects which the architect would do wisely to keep in view in the design of such buildings, though there are many other points that are modifiable which the observant architect will find out in the design of dwelling-houses.

Not only is there the tendency of plan to change, but modes of construction alter from time to time. In the evolution of great historic buildings we have ample evidence of the influence of climate, building materials, and religion. The ancient Romans soon found that the ancient buildings of Athens were unfitted to their many-sided civilisation. Instead of the simple one-story house constructed on the lintel system, they required storied dwellings and the construction of large interiors like that of the Colosseum. They called to their aid the use of the arch and of concrete, and so a new and more complex mode of construction was introduced. Again, we find the simple peristylar temple of the Greek gradually transformed into the basilican church as we see them in Rome and elsewhere. The Cathedral of Syracuse is a good example of the changes made in the structure. The external peristyle of columns was filled up like a wall, which converted the ambulatory between the columns and the naos of temple into an aisle. The walls of naos were pierced by openings, which united the aisle with the nave, and a chancel was thrown out at the east end. The posticum of the temple became the narthex of the church. The colonnaded timber-roofed basilica of ancient Rome became, it is well known, the model for the new churches. Still more instructive was the evolution of the domical vault from such a building as the Basilica of Constantine. The square bay of the basilica was domed over, while the ends were vaulted with half-vaults, till we get the grand, unobstructed hall of St. Sophia. Again, we can trace the development of the groined vault from the intersecting vault; the introduction of the transverse arches to the simple vault led to the formation of bays, the use of diagonal ribs to the groins or lines of intersecting vaults, and the filling up of this skeleton of ribs of masonry, and the substitution of the clustered pier for the cylindrical column completed the change, and we have the groined and ribbed vault of the later periods. These and other instances offered proof of the evolution of methods of construction in the past, but we have equal achievements to show in recent times. For example, the truss is a modern invention apparently evolved from the arch principle, and most of our great modern buildings show the application of this system in the roof and other parts, while in bridge construction the truss has shown its wonderful capabilities in the spanning of rivers. And in connection with the truss principle, we have our reinforced beams and floors composed of steel bars embedded in concrete—certainly a development of considerable promise; a system of construction which can be applied to almost every building for floors and roofs, staircases, partitions, for domical vaults, external walling, chimney stacks, and also to arches and vaults. There is no limit, in fact, to its application. In its use, therefore, we have a departure which promises to change, if not revolutionise, old systems of construction, and to introduce new types.

There are a few modern kinds of building which favour the introduction of the newer methods of construction. Such buildings would include factories, warehouses, great office buildings, and perhaps hospitals and workhouses; but there are others—those which have a traditional history, like the domestic dwelling-house, municipal buildings, churches, schools, which rather adopt methods and materials which have a past. So it comes about that the newer problems of architecture, being less conservative and having no old types to follow, have a stronger affinity for the new methods of construction than the old ones, and the result is that greater progress is made in buildings of distinctly modern use. In short, the modern plan eagerly welcomes the new materials and

methods, as we see in many of our great office and warehouse buildings, in theatres and halls, and in many of the recent buildings erected for large congregations. The spacious auditorium or hall arranged for a large audience calls for the removal of all obstructing supports and columns, and the galleries must be upheld by trussed steel cantilevers encased in concrete; the roof has to be constructed with the lightest material in a flat domical form. The design is so entirely removed from all previous types that greater liberty is permitted in the style of fittings. For acoustical qualities it is necessary to arrange the seats on a certain curve, to plan the hall and fittings with special reference to sound and resonance, to use materials that will favour these objects; so the ventilation and warming arrangements require the introduction of certain appliances. The newer methods of construction have not found so congenial a home in buildings of the traditional type, and architects also have not countenanced them. Thus in certain buildings like churches it has been hard to introduce anything thoroughly novel; the designers of such buildings have been very conservative in their tastes, and hence it is that modern methods have not reacted on the older types of building to the same extent. This will account for their adhering so persistently to old models. New materials and constructive methods have sometimes been instrumental in forming a new type of building. Perhaps the most powerful factor in this way was the substitution of the arch for the beam, and its influence upon the design of churches. The substitution of, say, brick for stone or granite, would not account for any great structural alteration, though it has changed many details, and has perceptibly influenced style. This is shown by the brick Gothic of Italy. But a method of construction, such, for example, as the domical vault, has done infinitely more, and a new construction of floor or roofing would influence structure materially. On the other hand, the purpose of a building cannot be altered by either material or method; it comes before actual structure, and it is mainly represented by plan. The ancient Romans adopted Greek design as far as they could; but they soon found it too restricted for their multifarious purposes, and they invented fresh forms, which have become the types of many modern structures. The one-story temple was of little use for their active military and official life; so in the same way the American office building or "skyscraper" is a modern departure in the populous city. These are types of structure based on requirements, which must be the controlling factors. A change of material or method of construction might alter or modify their architectural expression, but it could not do more. To consider the many kinds of modernised structures in these remarks would be impossible. We have the hospital and asylum class, the workhouse class, the modern school, elementary, secondary, and technical, the laboratory for science teaching, the library, bath, museum, theatres and halls for modern assemblies, the modern hotel and residential block of flats, office buildings, workmen's dwellings, and many others in which plan and equipment are of the utmost importance, and these constitute the modifiable type of buildings. These vary from time to time. Thus the tendency to develop in the hospital class of buildings has been marked during the last decade or two. The classification and isolation of certain classes of patients has led to marked divergences of ward planning, till we find the typical plan for fever patients in such an assemblage of buildings as Hither Green, or as exhibited in Edward VII.'s Sanatorium for tuberculosis at Midhurst, where the patients' bedrooms are all separated and approached by a corridor in the rear of rooms, and have a balcony in front accessible to each patient with wide hinged casements.

The bedrooms all face south or south-east or west. Equally marked is the development of the administrative department, where every improvement for the needs and comfort of patients has been provided with means of communication by lifts to every floor of the wards. Certain typical buildings can be studied by the architect in which all the necessary rooms, for recreation and dining, consulting and operating rooms for special cases, have been planned with the greatest economy, and it is in these directions that modifications are likely to be made with the progress of experience, and for which the architect has to be on the look out. The modern school plan affords another example. The trend of education has been to adopt scientific methods, to classify students according to age and standard, to multiply classrooms, to provide for special studies, laboratories, and lecture theatres. To take these latter, education has made such rapid progress that the earlier types of laboratories have been found to be quite inadequate, and have had to be remodelled on a new plan. Chemical and physical laboratories are now required in every large school. Science teaching has progressed so much that separate laboratories are called for, besides smaller rooms used for apparatus, chemicals, a balance room, in addition to lecture and preparation rooms. The lecture-room has to be provided with seats arranged on the isocoustic curve, the plan must be designed in reference to these seats and the lecture table, and for the exhibition of specimens, experiments, models, and diagrams. So the laboratory has to be planned to provide the necessary space for benches and students, tables, sinks, draught-closets, shelves, and other apparatus. Science schools are now so necessary that the old classroom is not found sufficient for practical work. The conditions for a laboratory are good light, height and ventilation, freedom from vibration, space for benches and tables, sinks, and draught-closets, and easy passage between the benches. Other improvements and modifications may be made as time goes on, and it is the architect's business to study these, and, if possible, anticipate them. So the type of school in which science is taught will be always undergoing change. Free libraries and museums form, again, another class of modifiable buildings. The public library is a decidedly modern type of building, but one capable of modification. In these the registration and rapid circulation of books from a counter, their convenient storage in cases, and the convenience of readers of newspapers and journals, and books of more permanent value, have to be provided for by suitable rooms, stacks of bookcases, sloped desks and tables, under proper supervision. The rooms must be top-lighted in most cases, with convenient ingress and egress. A few of the more recent designs have indicated a preference for top-lighted rooms, a spacious borrowers' lobby and hall, with provisions for storage of books in the basement or top story. The combination of library and museum is often seen in many provincial towns, as at the Corporation Library at Brighton and at Folkestone, where both are worked together under one set of officials. The type of museum is more permanent. Spacious top-lighted galleries planned with reference to the cases on floor and against the walls, with ample passage room for visitors, are the main requirements. Then we have the large hotel and residential block, both buildings which have been developed during the last fifty years. We cannot say that these structures have been perfected. The improvements in various mechanical and electric appliances, lifts, motors, electric lighting, telephonic communications, are constantly leading to some modification of internal structure. Cooking arrangements and fittings have made rapid advances, requiring con-

tinued thought and contrivance on the part of the architect. In many of the larger hotels, here and abroad, the recreation and amusement of the visitors have become an item. Concert-rooms, and even theatres are, provided in the establishment—a combination of private residence with public entertainment which has added to the complexity of the design. The erection also of "flats" for residential purposes is a late departure in England, and has produced various types of arrangement in which the staircase and lift have become features. This class of town habitation promises to develop itself in the future in all our large cities. The large preaching-hall is beginning to assume in the hands of a few a distinct type of building, departing more and more from the early chapel or church type. Even in our large town churches the demand for a congregational area free from all constructional supports, and planned on acoustical principles, has become a problem with the architect which threatens, in some towns, to modify the traditional church plan. Christ Church, Brixton, lately erected for a popular preacher, is a type of plan that may be seen in many recent churches. Lastly, the modern homestead exemplifies in a remarkable manner the progress of agricultural economy. The old-fashioned farm buildings, as we pointed out last week, have been quite transformed. The large and rambling barn and adjacent sheds for livestock have been replaced by a smaller barn, where the threshing is limited to a small supply. Scientific principles of farming have altered materially the planning and relation of the sheds, and one result has been the use of covered steadings, with the food-preparing houses placed as conveniently as possible to the cattle sheds for easy consuming. A saving of the straw is effected by stall-feeding, and covered farmyards have been found to utilise, in the most economical manner, the ammonia. These changes have rapidly developed the type of new steadings; and modern labour-saving agricultural appliances have also been instrumental to the same end. Much, however, remains to be done to perfect the type of a covered homestead, not only in the collection of the refuse, but in the ventilation of the covered yards. It is needless here to discuss other buildings in which successive modifications have produced new types. When properly understood, these stages of evolution ought to suggest the lines of development or progress, and thus save much fruitless effort in design.

AMERICAN AND ENGLISH BUILDING METHODS.

COMPARING the English and American methods in the erection of buildings. Mr. Charles Heathcote, architect, of Manchester, drew a few instructive lessons in his lecture, given at the Society of Arts last week, which we reported in full. It was addressed to the Institute of Builders, and therefore the author confined his attention to the practical side of the subject. First of all, the lecturer spoke of the claim made by and for our American cousins, that of speed. We have several times spoken of acceleration of work, or speed, as hurry. As Mr. Heathcote remarks, all other things being equal, it has an exaggerated value. The English builder never boasts of his speed. All he cares for is efficiency, and, although he uses many methods for quickening the progress of his building, he rarely ever thinks speed worth putting on the same level as honest and good workmanship. A summary is given of the factors which make for rapid progress, in which a few points of comparison are noticed. There is one indictment against the English builder which has some truth in it: he is not always in earnest with his work,

and it is certainly more true of him that pleasure often comes before business, whereas with the American business comes first. Secondly, it is stated that the American architect is more alive to "rapid completion of the drawings and details of the approved scheme"; he also so arranges his construction as to promote rapid execution. "Coupling up steel stanchions tends to more rapid progress than endeavouring to provide polished granite from a Scotch quarry in winter." Thirdly, and it is quite true that early completion of drawings and details assists the contractor to organise his work as soon as possible, and this factor of progress is very often neglected in English work. The architect likes to take his time in preparing the contract drawings and details; he prefers to keep them back, with the object of giving them more consideration—a very good motive, but one which is prejudicial to the contractor's interest; whereas if the drawings and details were taken in hand earlier, or the contract postponed till they were ready, it would be a decided advantage to the builder, and the architect would obtain the extra time he required. American architects work early and late, and employ assistance to help them to complete their drawings and specifications; and the contractor spends more time in looking after the labour, and on overtime, on getting materials early. They do so because the American proprietor appreciates the importance of early completion, as meaning money to him. He does not hesitate to pay extra architect's and contractor's fees for this pecuniary advantage. Why should he? The English building owner, it must be confessed, is rather less practical and far-seeing; he makes up his mind slowly, hesitates about the design, and after he has made up his mind, he is in a great hurry to commence the work. The architect has little time to make his contract drawings complete, and hastens to have the main drawings and specifications prepared for the quantities. The American employer "values more the power of work in his employes than the amount of minimum wage," and if he can save time, will not begrudge the expense of obtaining the latest hoisting and labour-saving machinery. Then the working man takes the view, often exaggerated, that the more cheaply and speedily a thing can be produced through economising labour, the better it is for the trade. The American employer pays better wages to the men employed on labour-saving machinery, and this advances wages and finds more employment. The author compares this policy with that of our trade unions, which often compel their members to do as little work as possible. We have certainly a different view on the advantages of labour-saving in many kinds of building and architectural work. A great gain in speed and economy of production is not always or often the same thing as efficient labour and thoughtful work. The author of the paper we are discussing deals with these factors in detail, and touches on points we have raised when comparing American architectural training with our own. As we then pointed out from incontestable facts, experience, and letters in the *Times*, the American owners give an incentive to work, and men in the building and engineering branches are paid for their personal skill and devotion. The American likes work and application to business; his training commences early, and is based on technical or business qualifications, instead of merely academic acquirements as with us. Technical education is more valued than Greek or Latin. The interest of the youth is from the first bent on his business pursuit, and he thus takes more interest in his work, which is paid for according to his ability and skill. American industries and building are promoted by protection. The wages of all building operatives

are high, and home productions increase in the same proportion. In exporting manufactured goods it is pointed out a method had to be found to counterbalance the loss of exporting such goods to the Free Trade countries, and the introduction of labour-saving machinery followed. Some of our trades have been excelled; but Great Britain is still first in textiles and textile machinery.

The author points out that the American knows how to claim superiority for his work—he knows how to boast and advertise better than his English cousin; but, as a matter of fact, “the products of our Yorkshire mills are not equalled anywhere in quality and finish. Our carpets, cottons, cloths, the precision of our machinery, our shipbuilding, pottery, and cutlery are still unbeaten.” But it is admitted that though in quality and finish we are unbeaten, we are backward in introducing new ideas and improvements. The author, when staying at New York, admired much the finish of the baths and lavatory appointments and plumbing work in his hotel, but found out, to his astonishment, that a London firm had done the work. As the author says: “If this had been reversed, every newspaper in England would have contained an article on American enterprise, with gushing accounts, possibly paid for, about the decadence of the sleepy English sanitary engineer”—an instance which shows the reserve of English manufacturers compared with their self-advertising cousins. Our self-satisfied conservatism, the idea that what did for our grandfathers and made their fortunes ought to be good enough for us now, and that we could hold our own, has been our cause of failure. Recent competition with America has shown us forcibly the mistake of this position, and that we no longer can claim to possess the “workshop” of the world. Our methods are not the same. A Britisher going to the States soon adopts the quicker actions of the country, and it is a fact that the best brickwork in New York has been done by British bricklayers. The work is done under a different system, in which economy of labour and mechanical aids are combined, and the output is greater. The American workman has a greater inducement to work: he is encouraged in discovering new ideas and methods, whereas with us he is kept in a sort of groove, and is not assured of remuneration. But with us, as Mr. Heathcote says, it is not the highest speed that is wanted, but the old good workmanship and well-organised method. In building there is no superiority of American over English work; the former is done often by night by means of flares, ours generally in the daylight. Yet the architect, too, in America is more interested in his calling, and has a keener business and working capacity. Our younger men, at least, have not realised the importance of time saved in building and the profit attached to quicker use of it. The lecturer does not undervalue the advantages of time and leisure, or of slow construction in certain cases where speed would be risky, as in wall construction and foundations, but he lays stress on the necessity of furnishing the contractor with his drawings and details, and he further advises our younger men to fill the ranks of superintendents of buildings in our larger and more important works. The clerk of works is, of course, a valuable and much-needed official on all works, to check materials and to keep a watch on the daily progress of a building; but superintendence of a more special kind is necessary in some cases, which can only be secured by a highly-trained assistant, or a specialist in steel construction, as may be required. There may be several such supervisors to take sections of the work, under general control of the architect. These superintendents should be required to look forward in their particular section, and see that everything is ordered in time. The author says, on his own work, he

has “progress” plans, with the dates upon which certain parts are expected to be completed, the superintendent of each part seeing that the instructions are carried out. Every part of the work can be mapped out upon a well-organised plan in this manner. Many instances are noticed, to which we refer the reader. It is very true that a certain rate of speed in a building depends upon the relative cost. A low tender, if accepted, can only be carried out to pay the contractor by allowing a certain rate of speed. It would not be fair to expect a higher rate than that at which the contractor can make a profit. It is all the tenderer expected to do, and it is on this understanding the majority of contracts are let in America. So that on this ground, if a building is to be erected quickly the owner must be prepared to pay at a higher rate. The American building owners act on this principle: if they wish for speedy erection, they are glad to pay for it. But although the principle is adopted in this country, owners and building contractors do not act upon it in a business way. Given the same rate of payment and the same conditions, an English contractor will work as quickly and as well as an American.

Referring to English practice, Mr. Heathcote also mentions the number of bricks that can be laid per day. At the Westinghouse Works, Manchester, under the supervision of the author and Mr. Rodd, one of the first engineers of America, 1,600 bricks were laid per man per day, and this number has been laid at Parr's Bank in that city, on a two-brick wall with ordinary bond, set by trowel in mortar; but this tale of bricks was not the average. In the former building there was no general contract. All heavy work was at per ton, per foot cube, or square yard; the excavating was let to one firm, the steel to another, slating to another, &c.—all English firms. But the author shows there was a large portion of the work done and material delivered, and railway tracks put down, foundations prepared, and steelwork in readiness, before an American contractor came on the work as an official of the company. The work was rapidly proceeded with, and by time being saved in preparation the company benefited. Every drawing was ready, and nothing to wait for; extra wages were paid, and the best hands employed; and so any work can be accelerated by having the bricks and materials ready and to hand, and men encouraged to do the work by extra wages, with bonuses for work done against time, and plenty of superintendents and foremen. So much for speedy results. The author observes: “There can be no criterion of how many bricks can be laid in backing stone-work, in erecting buildings partly stone and partly brick; but in ordinary stock-faced building with stone dressings, internal walls with usual doorways, arches, fireplaces, flues, beam fitting, if a bricklayer averages 700 English bricks of common brickwork per day of 10 hours he is doing a fair day's work for 8s. 4d.” Other data are given in the paper on this question of bricklaying of general interest. On the question of heating buildings a few useful remarks are made. These go to show that we should have continued in complacent satisfaction had not the American and Continental engineers forced our heating-apparatus makers to keep pace for their own benefit, till now we have cast sectional boilers and radiators equal to either American or French. We commend the paper to all our readers, especially now when so much has been said and discussed upon our industrial output and the question of labour as applied to building operations. Government interference by Factory Acts, rules, regulations, &c., has been detrimental and hampering to our industries, for, as the author of the paper says, the first brickmaking machines invented in England were placed under a ban, and the men who worked on them were murdered,

and the contractors of the Manchester Town Hall about thirty years ago had to obtain police protection for their men who carried bricks without the ordinary hod; but it is the old story of prejudice and vested interests.

THE ARCHITECTURAL ASSOCIATION.

THE fifth ordinary meeting for the current session of the Architectural Association was held on Friday evening at the R.I.B.A. rooms, 9, Conduit-street, W., the President, Mr. H. T. Hare, F.R.I.B.A., in the chair. Messrs. C. J. Stewart, B. H. Colcutt, and P. G. Crawley were elected as members. The President announced the following additional donations to the New Premises Fund: Mr. C. P. Selby, £5 5s.; Mr. H. W. Lonsdale, £5 5s.; Mr. W. C. Butterworth, £3 3s.; Mr. Geoffrey Lucas, £3 3s.; “L. F.,” £2 2s.; Mr. J. W. Wyles, £2 2s.; Mr. H. W. Braddock, £1 1s.; Mr. J. B. Gridley, £1 1s.; Mr. A. S. Hewitt, £1 1s.; Mr. H. A. Legge, £1 1s.; and Mr. E. F. Cobb, 10s. 6d. A vote of thanks was accorded the donors. Mr. LOUIS AMLER, Hon. Sec., stated that at the meeting of the Discussion Section on the 16th inst. (Wednesday next) a paper would be read by Mr. A. O. Collard on “The Work of an Exhibition Architect.” He proposed a vote of thanks to Mr. Maurice B. Adams for the donation of some mounted prints of 1834, 1836, and 1857 of the Royal Architectural Museum, its casts, and a lecture given in that institution by Mr. Ruskin, which were shown on a screen; and also proposed a similar motion of thanks to the donors of the following lantern slides:—51 of Gothic work, presented by Mr. E. W. Wonnacott; 27 of Classic and Gothic work, by Mr. G. H. Lovegrove; 48 of Gothic and Renaissance, by Mr. Alan Potter; and 5 of Beauchamp House, Shoplands, Essex, by Mr. J. G. Gittins. A similar vote of thanks was passed to Mr. B. T. Batsford for the gift to the library of “The Drainage of Town and Country Houses,” by Mr. G. A. T. Middleton.

PHOTOGRAPHY FOR ARCHITECTS.

A paper on this subject, illustrated by numerous photographs and sketches, and by about a hundred lantern slides contributed by members of the Camera and Cycling Club, was read by Mr. FRANCIS R. TAYLOR. The lecturer remarked that there are many in our midst who consider that photography is opposed to the best traditions of the study and practice of architecture. It is, therefore, he added, my purpose to put before you facts which will prove that photography for architects possesses a value both in the study and practice of architecture which cannot be overlooked. The subject will be dealt with under two main heads—viz.: The utility of photography in (1) the study of architecture, (2) the practice of architecture, and the apparatus and appliances for architectural photography will then be briefly considered.

THE STUDY OF ARCHITECTURE.

The usefulness of photography in the study of architecture will be considered with reference to its value in educational work, and also to its value as a record of old work. Photography in its application to the study of architecture is simply a means of delineation, and it is the finished photographic print or lantern slide which is the valuable aid to study. Photography should not be considered as antagonistic to sketching. It has a utility in the education of the architect by producing an accurate delineation of old buildings unattainable by a sketch. It must not be forgotten that however valuable a sketch or measured drawing may be to the individual student who prepared it, there is the personal error to bear in mind when this method of delineation is applied for general study.

MEASURED DRAWINGS AND CAMERA WORK.

Photographs in conjunction with measured drawings undoubtedly form the best means for architectural study and research. It may be mentioned that in the “Architectural Association Sketch Book” there are examples of measured drawings, together with a photograph of the work. This method of illustration might be employed with advantage to a much larger extent, not only in the Sketch Book, but in all architectural publications. Whenever any old building of interest is to be pulled down to make way for modern improvements or for other reasons, a set of measured drawings with a series of photo-

graphs form the best record of the old work. In record work research should be made as to how the building has fulfilled its purpose and how its environment affected its design. To obtain this knowledge the employment of photography is a valuable assistance.

LANTERN SLIDES FOR CLASS TEACHING.

The method adopted for the training of architects by a system of instruction in classes has its value considerably enhanced by using photography as one of the means of illustration. The use of the lantern-slide in lecture work is a great step in advance of the ordinary lecture diagram. It is essential, in order to make the instruction imparted by lecture work of the greatest value, that the illustrations employed should receive concentrated attention whilst the various points are being explained. Diagrams specially prepared for lecture work are in the majority of cases of but little avail, and it is impossible for the lecturer to satisfactorily explain from them, even to an average-sized class or meeting, the various points dealt with, simply because they cannot be properly seen from every part of the room, and, besides, in most instances, are badly placed for the lecturer's use. Frequently the walls of the room are smothered with measured drawings, plates from the building papers, and similar illustrations, and an attempt is made to explain some points when only one or two present can see the illustration referred to. One does not object to illustrations of this kind on the walls if they are simply intended for those present at the meeting to see for themselves before or after the lecture, but to use them as lecture diagrams is really the height of absurdity. But all these difficulties are obviated by employing photographic means. Lantern slides of the actual work, of measured drawings, of illustrations from books and other publications—in fact, of illustrations from every available source—can be thrown upon the screen, can easily be seen by everyone, and enable the lecturer's explanation to be understood by all. Lantern-slides for architectural lectures should be made with a view to suitability of purpose. Photographs of buildings, both externally and internally, would be useful to illustrate the grouping and general effect, and then should follow photographs of towers and spires, of piers and arches, of eaves and bases, of doors and windows, of vaulting, &c., to illustrate the treatment of the parts, and, lastly, of mouldings and ornament. If a systematic sequence is followed, the slides would be of immense value in promoting the study of architecture. In illustrating constructive subjects, the same principles should be adhered to—explanatory lantern slides to illustrate the manufacture and uses of the various materials, and then slides showing the different methods of construction. Measured drawings, sketches, book illustrations, and, in fact, every process of delineation can be brought within the scope of the optical lantern. The possibilities of the usefulness of the lantern-slide in educational work is practically unlimited. The slides themselves should on no account represent more than is required. Simplicity should be our guide in these matters. All diagrams and book illustrations should be represented on the screen as large as possible. The attempt to crowd many illustrations in one slide should be condemned. A lantern-slide for lecture purposes should not consist of a confused jumble of details with meaningless letters or figures. It is bad enough in a text-book, but infinitely worse in a lantern-slide. The object of all study is to gain knowledge, and not to cause confusion. The use of telephotography in the study of architecture is one which should receive our careful consideration. In many instances parts of a building well worth studying are inaccessible for measuring, and in those cases an ordinary photograph gives a general idea of the composition and a telephotograph the details.

THE PRACTICE OF ARCHITECTURE.

The utility of photography in the practice of architecture might receive far more attention than it does. In many instances the only use to which photography is put in architectural practice is in the reproduction of drawings by the ferrographic process. In this process the reproduced drawings are either on a thin paper, or on a paper similar to Whatman's, and a black or brown line is obtained on a white ground. The advantage of the process is that the reproduced copies can be coloured similarly to an original drawing. A great saving of time is effected, because from one complete set of tracings any number of reproductions can be obtained. If the reproductions

are to be kept for a considerable time, as in the case of copies for the authorities, care must be taken in the selection of the paper, owing to its tendency to fall to pieces after a time. For this reason the authorities will only accept photographic reproductions on linen. The makers of the paper might consider the best means of surmounting this difficulty. It may be mentioned here that some of the papers used shrink slightly in the process of obtaining the reproduction—this emphasises the necessity of fully dimensioning all drawings. The ferro-prussiate process with a white line on a blue ground is sometimes used, but as colouring is then out of the question, it is not so suitable for general architectural work. Its use is limited to drawings where colouring is not essential, as, for instance, in details of steel construction. Besides this special application, the use of photography in architectural practice is generally limited to what may be termed the legal phase of our profession, although a wider application would be a distinct gain. No one will deny that photographs of buildings about to be pulled down are valuable records, and in ancient light, easement, party structure, and such-like cases would always be useful on one side or the other. If the building happens to be one of considerable architectural interest, then the value of the record cannot be overrated. In modern work, photography could be used to increase our knowledge and experience in a way little thought of, and the wonder is that it has not been more generally applied for the purpose. Photographs of a building at its various stages of erection, with the dates, and in some instances the time, noted thereon, would be a valuable record of the class of work, and, in addition, would be very serviceable in the valuation of certificates. Photographs of special works of construction in buildings of a distinctive type would be most useful for future reference when dealing with similar works. Photographs of the finished building should in all cases be obtained, and a comparison made by showing the photograph side by side with the perspective drawing. With reference to comparisons, a collection of photographs of similar detail and ornament of old and modern work would prove of use both in the study and practice of architecture.

THE PRACTICAL USE OF PHOTOGRAPHY

in delineating the progress of a structure from time to time is employed by engineers with the best results, and there is no reason why we should not do likewise. In a few isolated cases it is done; but it res's with the profession at large to avail itself of the opportunities within its grasp. This legitimate use of photography in our everyday practice would assist in grappling with many difficulties with an ease at present unknown. The utility of photography in the study and practice of architecture having been dealt with, it now remains to deal with the technical part of the subject. It is evident that in order to obtain the best results in the application of photography to the study of architecture that the taking of the photographs should be performed by ourselves, otherwise the photographs or lantern slides will not express the subject in the best way. It is impossible for a professional photographer to know exactly what is wanted unless he happens to have made a thorough study of architecture, and we know that in the majority of cases he has simply a mere smattering of our requirements. If his speciality is architectural photography, his knowledge of architecture may, in a general way, be said to be peculiar, and not, by any means, extensive. Consequently, if the work is to be done well, the photographs and lantern slides should not be left in his hands for selection of subject. There may be exceptions, but the exceptions prove the rule. It might, of course, be urged that the professional photographer could do the work under our guidance; but it will be found that this method is expensive, and is, in reality, only applicable in those instances where selection of subject is not required to any great extent.

RECORD WORK AND ITS RECORDER.

It is desired to make a thorough record of an old building. Here the best way to proceed is to make measured drawings of the building, and a complete series of photographs. Who is most capable of taking the photographs? Unquestionably, he who undertakes the recording of the old work. Again, in detail and ornament, who knows which is best to select for architectural purposes? Certainly not the professional photographer, for he would be in a state of bewilder-

ment, whereas the architect would not have the slightest hesitation about the matter. In the many requirements of architectural practice where the question of architectural selection does not arise, the photographic work can with advantage be delegated to the professional photographer. The architect who decides to use photography as an aid in his study and practice should understand

CERTAIN TECHNICALITIES OF PHOTOGRAPHY.

The questions which present themselves are:—What is the best camera for architectural work? What lens should be used? What photographic plates and papers should be employed? Dealing with the questions in order:—Firstly, What is the best camera for architectural work? Before anything can be done, the size of the camera must be decided upon. The ordinary sizes are: 4½ in. by 3½ in. (quarter-plate), 6½ in. by 4½ in. (half-plate), 8½ in. by 6½ in. (whole plate), 10 in. by 8 in., and 12 in. by 10 in. It is generally agreed that the larger the size the more expensive it will be. Besides this, the weight of the camera is a serious matter, especially as in the majority of cases the work would be done at a distance from home. For these reasons it may be conceded that the half plate is the most serviceable. When lantern-slide work is contemplated, the quarter-plate is generally selected, as that is the most suitable size for the purpose. If a good lens is employed, the quarter-plate size might be used for all work, as the photographs can be enlarged with satisfactory results.

THE REQUIREMENTS FOR A GOOD CAMERA

are:—1. Lightness, with rigidity. 2. Rising and falling adjustment to the front of the camera. 3. A reversing and swing back. 4. A long extension. 5. Parallel bellows, or only slightly conical. 6. Focussing screen and focussing adjustment. 7. Double dark slides. The lightness of a camera is necessary for convenience in carrying about, and rigidity is required to prevent movement whilst the photograph is being taken. The rising and falling adjustment allows the position of the photograph on the plate to be varied. In architectural work a considerable rise is frequently required. The reversing back is essential in order that the photograph can be taken in a horizontal or vertical position. In many cases the camera must be tilted to include the whole of building, hence a swing back must be provided, for the plate must be kept vertical, otherwise the vertical lines of the building would converge in the photograph. A long extension provides for the use of a long focus and telephoto lenses. Parallel bellows prevent the cutting off of the edges in the photograph when a short-focus lens is used. The focussing screen is the sheet of ground glass upon which the photograph is depicted. It is adjusted to obtain a clear, sharp image by means of a rack-and-pinion movement. The double dark slides hold the plates for exposure, and at least three, or, better, six, double dark slides should form part of the outfit. The questions to decide in the selection of a tripod stand is one of rigidity, compactness, and portability. Secondly: What lenses should be used? It is best to provide in an outfit for architectural work a set of lenses of different foci and of a good make. The lenses should be of a rectilinear type. For average work the rapid rectilinear of about 7 in. focus is most serviceable on a half-plate. Long-focus lenses are useful in detail work, and wide-angle lenses are essential in confined positions. The telephoto lens would be a most valuable acquisition in the equipment. Some of the best examples of detail work are at too great a distance from the position available to give a photograph of a satisfactory size; but a telephoto lens enables you to obtain it to a larger scale with the same extension of camera. As this lens is not of a fixed focal length, the scale of the photograph can be altered at will. Thirdly: What photographic plates and papers should be employed? Ordinary plates of a good make are the best for architectural work, especially for interiors, although in dark interiors, where very long exposures are requisite, rapid plates may be used with advantage. Isochromatic plates are useful where the lighting of the interior is yellow. In interiors where the light from windows, &c., would be likely to cause halation, it is necessary to use backed plates.

THE DEVELOPMENT OF THE NEGATIVE

requires care on the part of the operator; but this question cannot be discussed now. It may be mentioned, however, that the architect—

photographer should do his own development, and not follow the advice expressed in the well-known advertisement phrase of "You press the button, we do the rest." The chief printing processes can be classified under four heads—viz., (1) Silver printing-out processes; (2) platinotype; (3) carbon; (4) bromide; and the decision as to what processes should be adopted depends upon circumstances. A silver printing-out process, such as the well-known P.O.P. of various makes, produces excellent results; but if permanent photographs are required, then platinotype or carbon processes should be used. For enlargements bromide papers are most satisfactory.

The lecturer proceeded to describe in detail the processes of developing and printing out photographs, illustrated by examples on the walls of various methods, and added:—The architect photographer being fully equipped, now sets forth to take photographs. He makes a selection of some old buildings, and if he be an earnest worker he does not, as is often thought, make a tremendous rush at it. Whilst long exposures are being given, he devotes his time to finding out all he can about the building, and maybe he measures details and obtains full sizes of the mouldings. It seems to be a stock argument for the opposers of photography for architects to refer to the inverted image on the focussing screen, as if that were the important part in studying the work. That is only a means of obtaining a good photograph, and as to the inverted image, one gets used to it in precisely the same way as our minds have been able in infancy to correct the impression of the inverted image which is produced on the retina of the eye. And now, in conclusion, it is hoped that the various points raised will be fully discussed in an impartial spirit. The great question before you is the utility of photography in our study and practice. The value of combining photography with measured work should receive a large share of your attention, and encouragement is much needed for architectural research, and in giving it every method of delineation should be recognised, together with a clear description of the work and its history.

Mr. ARNOLD P. MITCHELL, in proposing a vote of thanks to Mr. Taylor, said he was hopelessly opposed to the lecturer's views as to the relative value of sketches and photographs in the study of architectural detail. Sketching and measured drawing were the best possible practice for the young architectural student, who ought to leave photography to the older man, who had no leisure to spend on a building. As soon as a young architect obtained a camera the use of the pencil was abandoned. The trained architect who did employ photography had an enormous advantage over the professional photographer, in that he knew what was worth taking, and the point from which to take it. He exhibited on the screen half a dozen slides taken with a three-quarter plate camera by an amateur, which he thought were superior to any that had been shown that evening.

Mr. GEORGE SCAMELL feared that if architects adopted Mr. Taylor's hint and photographed freely from published works they would soon find themselves involved in copyright difficulties. In photographing monuments and buildings, it was a very great advantage to introduce into the view a clearly marked scale. Such a measure broadly defined in English and French dimensions to a metre and a yard was issued by the Society of Antiquaries at 6d., and would be found very useful. His own practice was to invariably use a whole-plate camera, stopping it down with cardboard screens to the required size. To the camera a little plumb-bob and string could be added for 3d., and was most necessary for architectural work. The camera should have square bellows; the lens, which must be astigmatic, should not be in the centre of plate, but as high as possible, so as to reduce the foreground, and obviate raising the front. As plates were heavy, he used Wellington Ward's films, and this prevented halation and reduced the weight of kit to 12½ lb. as against 18 lb. when plates were carried. For developing, ortol was quite as good as pyro, and did not stain the fingers. The only safe material for mounting was starch paste. In exposures he would advise the beginner to err on the side of overdoing it; but the water meter was a very good test for light.

Mr. HUGH STANNUS remarked that Mr. Arnold Mitchell had added a new terror to lecturers by bringing a few picked slides to take the shine out

of the lantern illustrations. For taking details in vaults and other inaccessible places he had a swivelling reflector, which hooked on to the front of his camera, and enabled him to get the floors and roofs of tombs, and also ceilings. At the University College, Liverpool, Professor F. M. Simpson had the surface of the wall in his classroom which was pierced by windows, and was therefore the darkest, prepared, so that the lantern faced this, and the students could see the views, and yet had sufficient light to take notes of the lecture. The suggestion might be borne in mind in fitting-up the Royal Architectural Museum. He did not agree with Mr. Taylor in his advocacy of the lantern for studying constructional details. For examining beams and girders slides were useless, whereas models were all important. The comparison of two points, or of a plan and building was difficult with the lantern. Two lanterns projecting on the same screen were sometimes employed, but the expense and inconvenience were very serious objections, and perhaps the best plan was to rephotograph both on the same slide. While a student was watching his chance, say, for forty minutes, to take a dark interior, he should be sketching or studying the work, so as to let the impressions soak into his mind.

Mr. JOHN D. CRACE observed that the lecturer had not referred to what was certainly one of the most valuable phases of architectural photography. A student could examine a photograph or slide slowly and at leisure, and thereby see far more than could be realised in the building itself. He remarked how the late James Fergusson showed, after long study of photographs of the Erechtheum at Athens, various slip joints and other evidences of change of plan on the part of the builders. Such details might escape the most observant man while on the spot, but were comprehended by careful study of the photograph. Half the success of a good photograph depended on the selection of an appropriate light to suit the subject.

Mr. E. W. WONNACOTT advised the young photographer to purchase the best lens and other tools that he could afford. He wished Mr. Taylor had shown only half the number of slides on the screen. It would have been easy to have selected half a dozen quite equal to the picked ones brought down by Mr. Arnold Mitchell.

The PRESIDENT, in putting the vote of thanks, with which the name of Mr. Wonnacott was coupled, and which was heartily accorded, urged that photography should be an assistant and not a substitute for sketching and measured drawings. As a matter of fact, they all knew that Mr. Mitchell was a sketcher *par excellence*, and had taken that evening rather an extreme view as to photography; a medium course was the safest. No young architect should employ a camera until he was out of his pupillage. A measured drawing followed by a photograph would give absolutely the best record that could be made of a building or monument. The disadvantage of lantern-slides for lecturing purposes was the transient nature of the study. Mr. Taylor had not dwelt on the great value of photographic records in light and air cases, and for questions of progress of work at stipulated dates.

In acknowledging the vote of thanks, Mr. TAYLOR remarked that Mr. Mitchell was an admirable draughtsman; but he did not despise the use of photographs to illustrate his excellent lecture on architecture. He agreed with Mr. Wonnacott that if an architect took up photography, he should procure the best tools and turn out the work thoroughly well. For lantern lectures it was only necessary to darken one-half of a room, and enough light would be left to enable the students to make notes.

THE STATUTORY REGISTRATION OF ARCHITECTS.*

THE protection of the profession of architecture from unqualified practitioners is by no means a modern conception. So far back as the days of Vitruvius, the celebrated architect, complaint is made of irresponsible and uneducated men practising the art. He says in the introduction to his sixth book:

When, therefore, I see this noble science in the hands of the unlearned and unskilful, of men not only ignorant of architecture, but of everything relative to buildings, I cannot blame proprietors, who, relying on their own intelligence, are their own architects.

And in his tenth book, referring to the manner in

which the City of Ephesus dealt with incompetency, he says:

Would to God that such a law existed among the Roman people, not only in respect of their public, but also their private buildings, for then the unskilful could not commit their depredations with impunity, and those who were the most skilful in the intricacies of the art would follow the profession.

I do not propose to occupy your time at any great length this evening, but desire to point out as briefly as possible the main features and progress of the movement we are now met to discuss. In introducing my subject, I must necessarily go over some ground with which some of you may be familiar; but for the benefit of those to whom the question is new, I should like to define

WHAT WE MEAN BY REGISTRATION.

In the present it means that every man practising architecture shall be enrolled in an official register under an Act of Parliament, and be responsible for his professional actions, and that no one be allowed to practise until he is duly enrolled. In the future it means that no one be allowed to practise architecture until he is duly qualified, and has been found so by undergoing a qualifying examination. It means, in fact, little more than making the Institute examination compulsory by Act of Parliament. It is a matter for surprise that this obvious benefit should not have been secured to the profession long ago, seeing the advantage a qualifying examination has been to the learned professions of law and medicine.

WHY IS THE REFORM NECESSARY?

There is a vague notion among the general public that architecture is one of the fine arts. This is all very well as an abstract theory; but when it comes to the practical application of architecture, and the actual individual who is to translate the theory into practice, the public know very little how and by whom it is done, and, I think, care less. The profession, as it is styled by courtesy only, is not looked up to and respected, contrary to the learned professions just mentioned, and I think if we look at the present position and practice of architecture in this country we shall find a reason. Any person with or without a fair general education, any builder, builder's foreman, clerk of works, clerk in a Local Board office, auctioneer, undertaker, &c., with the sole qualification of being able to provide a brass plate, is at liberty to advertise himself as a person qualified to give advice to the public in the science and art of architecture. We in London suffer from builders, decorating firms, and others who, going out of their proper province, boldly proffer their services as architects to their customers gratis, and the apparent saving of five per cent. is not to be resisted. Some firms even go to the length of announcing that a competent architect is kept upon the premises—I suppose like the shopwalker. Can it be a matter for wonder that architects are still unrecognised while such a condition of things exists, for at present the public have no guarantee that the class who call themselves architects are any better qualified to plan and design their buildings than the contractors who erect them, and should they employ an architect they have no means of ascertaining that his knowledge is greater than that of the builder, and the only certainty about it from their point of view is they will have to pay the professional charges.

WHO IS TO CARRY OUT THE REFORM?

I have no hesitation in saying that if this thing is to be done the Institute has to do it. It is not my intention to-night to say one unkind word against the Institute; but I would like to venture on a little friendly criticism and point out how far it has gone in the direction of registration. The Council of the R.I.B.A., in its session of 1859-60, drew up a special report on an Architectural Examination, from which the following is an extract:—

The ultimate result should, in their opinion, be the establishment of a system of compulsory examination extended to all architects, whether members or not of this Institute.

It also states in the *Kalendar*:—

The R.I.B.A. desires to obtain for all those entering the profession a systematic course of education, thereby laying a foundation of artistic and scientific knowledge, upon which to cultivate any natural gifts and develop any aptitude for invention or design he may possess.

On May 3, 1890, it passed the following resolution:—

That while not opposed to the principle of compul-

* A paper read before a meeting of the Manchester Society of Architects, by Mr. ELLIS MARSHALL, on Dec. 10, 1903.

8017 examinations as applied to those about to practice architecture, the Institute is of opinion that the difficulty of restricting by statutory powers the practice of architecture to those who have passed an examination is at present so insuperable, that it is undesirable to make an immediate application for such power.

To what does this resolution amount but the admission that the principle is a good one, and that the difficulties in the way are the only bar to progress? Why do we band ourselves into societies and associations unless it be for the express purpose of overcoming difficulties and bringing about reforms for the general good? More than two years ago the then President of the R.I.B.A., in his inaugural address, urged the Institute to follow the lines of the Incorporated Law Society as regards solicitors, his remarks being thus commented on in the *British Architect* :—

If this is not Registration pure and simple we should like to know what is. In the light of this pronouncement of the President we really fail to see the force of the Institute's opposition to the Architects' Registration Bill: in principle and essential particulars it is on much the same lines as the President's proposal.

Again, Sir William Emerson, P.P.R.I.B.A., is reported to have publicly stated that :—

What was wanted was that the status of the architect should be more clearly defined, and to this end it would be a good thing if Parliament were able to pass some measure by which their town and country should be prevented from being disfigured by the work of builders without guidance, or by men who had absolutely no justification for practising as architects.

The latest presidential announcement is, however, of a passive-resisting type, and states that "inaction on the part of this Institute has been deliberate and intentional." This inactivity is placing the Institute in a false position, and is causing a vast amount of dissatisfaction, especially among provincial members, as the want of such a measure of reform is felt far more keenly by them than the London men. The necessity for a higher standard of professional excellence and public confidence is of essential importance to provincial men. There is a feeling—a mistaken one, if you will—that local architects are all very well for the ordinary work of the town; but as soon as any work of primary importance is to be executed architects from outside are invited to compete. Does not this arise partly from a want of confidence, there being no guarantee in employing a man who is styled an architect that he really knows his business? But nine cases out of ten it is the local man who, from his knowledge of the materials of the locality and the special requirements of his fellow townsmen, is more likely to carry out the work satisfactorily than an architect from a distance. Of what use is it for the Institute to say that its examination is a panacea for the existing evils, unless this examination is made compulsory? Until men find that by undergoing a course of study and passing an examination they are placed in a better position in the eyes of the public than the man who possesses no qualifications at all, it is very unlikely that an appreciable number of men will voluntarily come forward and avail themselves of this means of entering the profession.

THE ATTITUDE OF THE "MEMORIALISTS."

I can quite understand the attitude, although I do not agree with the opinion, of the coterie of art men who, in a memorial addressed to the Institute in 1891 and quoted by the President in his address, said :—

That a diploma of architecture would be a fallacious distinction, equally useless as a guide to the public and misleading as an object for the efforts of the student, and that no legislation can protect the public from bad design.

The attitude of these gentlemen is at least logical, because they don't believe in any examination at all. But where an examination is a settled policy it is absolutely illogical to hind heavy burdens on the backs of its student members in the way of a difficult and prolonged course of study and examination, and then to offer them nothing in the way of protection from the man who has passed no examination at all. The only logical sequence of education and examination is protection and registration, or why have any examination at all? Did it ever strike you what an incalculable amount of harm this voluntary examination is doing? You know as well as I that by far the larger number of candidates fail to satisfy the examiners, and what becomes of these? They are not debarr'd from practising, as they would be under a Registration Act; but they are let loose half-educated, and a menace to the public and a discredit to the profession for which they have imperfectly fitted themselves. ~

THE ATTITUDE OF THE PROFESSION TOWARDS THE MOVEMENT.

We are informed, but upon what authority I do not know, that there is a considerable body of opinion strongly against the movement, and that it is outside the realm of practical politics. This I deny. What are the facts? From a recent poll of the profession, *i.e.*, of all members of any recognised Architectural Society, more than two-thirds replied in favour of Registration, only 170 replied as opposed to it, and the balance, I think we may fairly assume, were either indifferent or had not sufficiently thought out the subject, and therefore did not reply. Your worthy President has taken the trouble to obtain the general opinion of the Allied Societies, and I quote from his address :—

In order to ascertain the general feeling on the subject, I have invited the opinion of the various societies in different parts of the country, and out of twelve from which I have received replies, six were in favour of registration, one against, two were divided in opinion, and three had not discussed the question.

The President of the Northern Architectural Association, Mr. J. Walton Taylor, F.R.I.B.A., in his opening address, says :—

With regard to Registration, the allied Presidents were in favour of it, but thought the Institute was the proper body to take the subject up.

Mr. Butler Wilson, President of the Leeds and Yorkshire Architectural Society, said in his opening address :—

I hope at the next election of the Institute Council that the question whether candidates are in favour of Registration or no, will be rendered even more acute than at the last election when, without organised effort, we succeeded in placing thirteen declared registrationists. There are still about a score members who are neutral. But we must insist on their declaring themselves one way or the other, so that we may know which way to vote. You cannot get anywhere by neutrality. It is not a quality which makes for advancement. To render the co-operation of the allied societies effective, I shall propose an association between us which would make Registration the crux of the next elections.

Again, meetings have been held in the following towns: Cardiff, Bristol, Exeter, Leeds, Liverpool, Manchester, Birmingham, Newcastle, Sheffield, Edinburgh, Glasgow, at all of which resolutions were passed, with some few dissentients, in favour of the proposal. The Royal Institute of Architects of Ireland has decided in its favour, and has intimated that if the English Institute will not do it they will do it themselves.

THE FEELING ON THE CONTINENT.

What are our Continental brethren doing in the matter? (1) The Fourth International Congress of Architects, held at Brussels in 1897, by a unanimous vote agreed to the following resolution :—

That the architectural societies should unite, and conduct an energetic campaign to obtain from their Governments the institution of the diploma.

(2) The Fifth International Congress of Architects, held in Paris in 1900, passed a resolution, which was unanimously adopted, to the effect :—

That Governments should take steps to protect and secure respect for the title of architect by reserving it for the future, and without retrospective action, for architects provided with a certificate of capability, or by forbidding its use by others; and, further, should place such certificate within the reach of all by the spreading of special architectural education and training.

(3) The States of Iowa, Illinois, and California have passed such a law, and other of the American States are seriously considering the question. The province of Quebec has adopted a similar policy.

(4) Germany and Hungary oblige all public architectural officials (State or municipal) to have a Government diploma. In France the method of appointing Government officials approaches that of making a diploma necessary. In Italy, Spain, and Russia our profession is a closed one. Surely then the matter is ripe for us and the season opportune, and it is within the realm of practical politics. The longer the matter is left the more growing is the evil and the harder it will be to accomplish.

THE ADVANTAGES OF REGISTRATION.

To put the matter shortly, the advantages arising from registration are these :—

Closing the doors to incompetent men.

Raising the standard of the profession.

Obtaining the confidence of the public and State recognition.

It is not proposed for one moment to say all who desire to build should employ an architect, but what we do propose is that henceforth, in the interests of the public, no person shall be entitled to call himself an architect whose name is not enrolled as qualified under an Act of Parliament, and any person wishing to employ an architect

may, by consulting the official register, ascertain what men are qualified.

SOME ALLEGED OBJECTIONS.

I will not deal with the objections. And I think I may first venture to deal with those raised by the worthy President of the R.I.B.A. (which I have no doubt you have all read), as this is the first time that an opening address has dealt at all exhaustively with the subject of registration. We are told by him that "Protection is in the air," and, without wishing to introduce any political element into our discussion to-night, I agree with him; but for us it is architectural protection. He says "Protection is in the air, I know, and I am not rash enough to express any opinion upon it." I have, however, whether rashly or otherwise, a strong opinion on the subject, and say that we have suffered sufficiently long from free trade in architecture, and it is time we tried a little protection in the way of education and registration. We are told "that an artist is born, not made, no questions and answers admit him into the fold." Now, gentlemen, I ask what fold? What is a fold? It is a place of safety inclosed within a high wall where protection is offered against the wolves that raven. Where is this fold offered to the architectural sheep who seek to come within it for shelter and protection against the architectural wolves? I say it does not yet exist; and if, as some say, it does exist, it only partly surrounds the fold in the way of an Institute examination, which is not compulsory, and is therefore useless for the purpose. What we aim at by our registration is to make the wall complete, and then it will become an architectural fold. Again, referring to the expression, "an artist is born, not made," I want to know who was the author of this catch sentence? I say it is a fallacy. Horace, I think, says, "*Poeta nascitur, non fit*"—a poet is born, not made; but a poet is a very different man to an architect. I won't refute the fallacy myself, but quote to you the words of the President of the Ontario Association of Architects. He says :

Nor is there any real force in the stock objection that architecture is an art, that an architect must be an artist, and an artist cannot be made by examination. . . . But there is much in the way of putting a thing, and I am not afraid to take the highest type of architect as a subject for the examination theory, and affirm that the saying that an artist is born, not made, is only half a truth. That one cannot be made an artist who is not born an artist is true; but it is equally true that one who is born a potential artist must also be made an effective artist. *An artist must be both born and made*, and an examination—which is but a short form of expression for the education which the examinations are instituted to test . . . and even compulsory examination, is the only sure road to make a heaven-gifted artist able to make use of his gifts.

In the President of the Institute's address we are treated to a little parable of the two undergraduates who were trying to induce a tortoise to put his head out of his shell by holding out some tempting bait without result, and an Oxford Don, after watching them for some time, quietly said, "Don't you think, gentlemen, you had better try the other end?" Now I am going to interpret this parable to you—but not in the way the President did. The allusion to the tortoise very aptly typifies the Royal Institute of British Architects in its attitude towards registration. The Don is the President, and we are, in order to draw us off the scent, asked to leave the educational end, that we have been pegging away at so long, and invited to "try the other end"; but we must decline the invitation—firstly, because we are sure we have got hold of the right end to start with, and by a little more perseverance we shall get the Institute to move, and, secondly, the only other end would be to put an end to the examination altogether as a logical sequence to parting with registration. No, gentlemen, this matter is not to be lightly brushed aside by such specious arguments and fallacies as I have endeavoured to expose. Objection has also been urged against the movement that it will create a monopoly, and thus be opposed to the principles of modern legislation; but there cannot be a monopoly created where it is made possible for anyone who proves himself qualified to share the rights. Another objection is that it will be necessary at the outset to register some of the very men who have caused all the mischief. This is very true, and unless this is done it will be found that Parliament will not listen to you. That you must respect vested interests is an axiom of Parliamentary practice, and where a man can show that he has practised architecture, Parliament will say you must not deprive him of his rights, and the obstinate

attempt to exclude this principle from the Medical Act was the chief cause of delaying its passage through Parliament for thirty years. Another conscientious objector is the art architect, and there is, of course, a good deal to be said from his point of view; but I think he looks at the question from his point of view only. He would be quite in favour of registration if all incompetent and inartistic persons could at once be debarred from practising; but if the inartistic and incompetent are still to be tolerated, and even recognised, until time has worked the necessary change, he prefers matters to remain as they are, and to leave the public to discriminate between the good and the bad. But the practice of architecture is a composite one, and includes not only the artistic, but the constructive, hygienic, and scientific, and therein lies its difference from the sister arts, and the need of special training in addition to the artistic spirit. I cannot agree with the purely art architect that you are lowering the dignity of architecture by making it a profession, and that it requires none of your registration. I maintain that at the present time architecture is trailed in the dust at the heels of many men utterly unworthy of the title of architect; but by a scheme of education and registration we shall raise it above its present unsatisfactory surroundings to such a height as will at least bring it to the level of the learned professions; and after this has been attained, then develop and foster the artistic side as much as you will—and the more the better. That you cannot examine a man as to his artistic attainments is partly true. But a painter is no less a painter because he has been instructed in the science of perspective, or in the proper manipulation of his colours and their chemical composition. Or a sculptor is none the worse for a complete course of study of the anatomy of the human figure. We do not, of course, claim that architects can be manufactured from study and examination; but what we do claim is that there is a constructional, hygienic, and scientific side to this question, which is of quite as much importance as the artistic, but which, unlike the arts of painting and sculpture, affects the comfort, health, and well-being of the community, and, this being the case, the men who take upon themselves the responsibility should prove themselves competent. When we dislike a picture or a piece of sculpture it is easily put out of our sight. But it is a much more serious matter with our buildings if, when erected, even with or without artistic merit, they are found unfit by reason of the wrongful disposition of the rooms or fireplaces, or are unsound by reason of faulty construction, bad ventilation, or sanitary defects. Architectural taste is always a changing quantity, so that it is not pretended that it is desirable to examine on the strictly artistic side of architecture, even if you could find examiners who would be agreed on any one point; but the scientific, practical, and constructional side is one to which examination may be applied, as also in the principles upon which architecture is based, and its rise, progress, and development. I will not to-night go into the details of the Registration Bill; suffice it to say that it follows on the lines of the Medical Act. Difficulties to be got over there undoubtedly are; but as the medical profession overcame the difficulties that beset them with regard to the chemists and apothecaries, so also shall we the difficulties with regard to surveyors, engineers, &c., and it is not for us to raise difficulties, but to overcome them as they arise. The first effect of a Registration Act would be to put a stop to any further increase in the number of incompetent practitioners, and thenceforth they would become a diminishing quantity. I appeal to-night to the young men to assist in this matter. It is for them we are fighting this battle; to us who are getting on in life the question will soon have no interest; but we have an abiding interest in our art, and are still willing to assist you in carrying through a great reform which will be to your benefit and that of all good architecture in this country.

SURVEYORS' INSTITUTION.

THE PRESERVATION OF TIMBER.

At the ordinary general meeting of the Surveyors' Institution, held on Monday, a paper on "The Preservation of Timber" was read by Mr. E. T. Scammell, F.R.G.S. The president (Mr. A. Buck) occupied the chair. The author claimed a special importance for his

subject in view of the great and increasing demand for all classes of timber, for which no substitute had yet been found, and of which the consumption in this country alone had more than doubled during the last half-century. In Europe there were only five countries which exported timber, and the amount exported by them all was nearly 2½ millions of tons short of the quantity required by Europe alone. The immense destruction of forests, for legitimate purposes, by waste and by fire, had brought us within measurable distance of a timber famine which might prove disastrous to our commercial and industrial life. Hence the necessity of making the best use of what timber we have. If it were possible to render timber less subject to decay and more durable, and even more fit for industrial use, by means of some method of preservation, no effort should be spared to secure this result; and if timber, now useless for commercial purposes, could be saved from decay, much would be gained. The object of all processes for preserving timber was to prevent or check decay. The causes of decay were, briefly, fungi, bacteria, insects, and worms. The parasitic fungi often rendered trees useless, and they also acted as agents of decay after the tree had been felled. The most important was the *Merulius tachrymanus* which produces dry rot. The spores, germinating on damp wood, particularly where ammonia fumes were present, under the influence of moist air spread in spawn-like threads throughout the wood, forming greyish-white cords and flat cake-like masses of felt on its surface, and on the surfaces of damp soil and brickwork, and thus spread to adjacent timbers. Imperfectly seasoned timber was most susceptible to dry rot, and the fungus could be spread to sound wood even by the saws and clothes of workmen; but timber kept dry was safe, as exposure to really dry air was fatal to the fungus. Previous creosoting of the ends of beams inserted in walls was a protection. Bacteria were also inimical to timber, and recent investigations had proved that probably no change took place in the chemical nature of wood without the active working of some living organism. Among the chief aids to the growth of bacteria and fungi were heat and moisture, without which they could not grow. Excess of cold, of heat, or of moisture (as in the case of timber preserved indefinitely by entire submersion) had a preservative effect. Decay caused by insects and worms was due chiefly to larvae of moths, termites (or white ants), or ship worms or *teredos*. The "death watch" beetle was also responsible for holes in oak timbering and in furniture. The general methods of preservation were by seasoning, natural or artificial, charring or scorching, impregnation. Seasoning rendered wood, when thoroughly dry, practically indestructible. Egyptian wood now existed which was 3,000 years old, and other instances had been found in cave dwellings or buried deep in earth which must be much older. (This wood, as Professor Boulger remarked in the course of the discussion, had not only been thoroughly dried, but had been kept perfectly dry ever since, or, on the other hand, had been continuously under water). If it were possible so to season timber as to reduce it to a skeleton of lignin, there would be little need of other treatment, but the process was a long one. The process might be accelerated by immersion, by which many undesirable constituents were soaked out, and the subsequent drying, if conducted under correct conditions, produced the best and most lasting results, but these were not always uniformly satisfactory, and timber dried by any process calculated to hasten its completion was not always free from defects. The United States Agricultural Department found that properly kiln-dried timber was soon ready and perfectly seasoned. There were two methods, hot-air and steam, of accelerated seasoning. It had been held that steaming reduced the strength of the timber, while too rapid hot-air drying was apt to produce "case-hardening," and at least one high authority affirmed that until the objection to steaming at high temperature was overcome, it was at best a makeshift, and could never replace open-air seasoning, possibly followed by kiln-drying. Processes for accelerated seasoning were, among others, the *Charteris Shapland* system, consisting of placing the timber in a drying-chamber at normal temperature, gradually raising the heat, and encouraging the "sweating" by live steam, and allowing gradual cooling. The *Erith* was a moist-air process, in which warm and very moist air

was constantly circulating around the timber. The *Haskins* was a system by which the general principle of charring was applied to the whole of the wood. The *Parsons* was a drying-kiln system, which the author believed had been in successful operation. The "Sturtevant" was again a kiln system, with a combination of steam-heater and centrifugal fans. The *Superheated Steam* process was a method of steam drying at a very high temperature, for which much was claimed. Charring was an old principle applied to the piles of Venice and, years ago, to the timbers used in our navy. At present it was used for piling and fencing, and sometimes for railway sleepers; but unless the timber had been first well seasoned the process would only hasten its decay, and at best was only temporary in its action. The subject of impregnation or the antiseptic treatment of timber was an important one, the theory being that by it the timber was rendered immune from the attacks of destructive agents, and in some cases its physical properties were improved, and it was rendered less inflammable, if not quite fire-resisting. There were, it had been said, four points to be kept in view. The preparation employed must be poisonous to bacteria and other destroyers, it must be easily applied and permanent, it must penetrate the wood throughout, and it must be cheap. Without saying how far the different processes in vogue fulfilled these conditions, the author proceeded to name the principal ones. The first, in order of date, was *Kyanising*, by means of corrosive sublimate or bichloride of mercury, invented in 1795 and patented in 1832. It had been very popular and successful except in water, especially sea-water. *Sulphate of Copper* had been much used, and was still employed to a limited extent in France for telegraph poles and sleepers. *Burnettising* by chloride of zinc was patented in 1838, and while the chemical used was a powerful antiseptic, it had the disadvantage of being extremely soluble in water. *Creosoting*, so called, by saturation with heavy oils of tar was now used in many ways, and was cheap, lasting, and useful in rendering the wood damp-proof. Besides these methods, there were many others which had recently come into use, among them being *Carbolineum Avenarius*, for which it was claimed that "it penetrates the wood, drives out the moisture, makes it impervious to damp, and protects from rotting, decay, or the action of gases and acids." *Solignum* was a stain and preservative applied either cold or hot, as a preventive against ants and sea worms. *Jodelite* was said to prevent dry rot, damp, and fungus, and the ravages of ants and insects. *Atlas Wood Preserver* consisted of immersion in, or painting with, a solution which was said to prevent destruction by insects, harden the fibre, and strengthen and season the wood. *Stop-rot* was said to be especially serviceable in Tropical climates as being proof against insects. Of true impregnation processes, as distinct from surface or painting methods, the author mentioned several, the first being the *Hasselman* or *Xylosote* process, which consisted in boiling the wood in a solution of the sulphates of copper and iron, with alumina and kanis, by which process the sap was dissolved and carried off, fungi were destroyed, and the iron formed a chemical combination with the cellulose in woody fibre which was insoluble in water. (A subsequent speaker averred that such a chemical combination of iron and cellulose was absolutely impossible.) The *Electric Seasoning* process consisted of the use of solutions of zinc, magnesium, and ammonium sulphate "forced into the wood by electricity." After complete saturation the timber was thoroughly dried, and it was said that green wood, so treated, was improved even more than seasoned wood. The *Non-Inflammable* process aimed, as its name showed, at fire-proofing timber by impregnation with various chemicals. The *Powell* system of wood preservation was the outcome of experiment by its inventor, whose attention was drawn to the fact that timber impregnated with sugar, or used in contact with sugar manufacturing, was never affected by dry rot. It consisted simply of boiling in a thin saccharine solution, and subsequent drying at a fairly high temperature. The result was to increase its strength, durability, elasticity, and cohesiveness, and to improve its appearance. It produced no cracking or splitting, and even reduced cracks in seasoned timber. It lessened the porosity and tendency to warp, split, or expand, and liability to dry rot. One of the chief claims for the process was that low-class woods, such as poplar, could be so improved as to

fit them for many purposes for which high-class woods were now used, and if this were the case it would indeed prove valuable to growers and users of timber in this country.

A discussion followed the reading of the paper, in which part was taken by Mr. T. A. Dickson, who, having to manage land in a hunting country, would be glad, he said, to know of any process by which the life of posts and rails (the posts more especially) could be prolonged; Mr. Harston, who fully recognised the importance of the subject as bearing in many ways on building and fencing; Mr. W. J. Ingram, who said that in his county of Sussex landowners and agents would be glad, in the present impoverished state of agriculture, to be able to use timber for many classes of buildings, where, under the present ridiculous by-laws of the local bodies, it was forbidden; Mr. H. J. Elwes, who wished that it were possible to have some definite statistics of costs and results of the various processes; Mr. A. L. Howard, who, speaking as a practical timber merchant, said he thought one of the greatest causes of decay in building timber was not so much imperfect seasoning, but the using of well-dried timber in damp and unventilated situations; Professor J. E. S. Boulger, who, after explaining the scientific aspect of the process of seasoning, expressed an opinion that, so far as he was able to judge by practical tests, the "Powellising" process was a very promising one; Mr. Gabbett and the President, who briefly commented on the great value of a paper inviting discussion on such a topic.

"COTTAGES NEAR A TOWN."*

THE suggestions made in the little book under this title, by Mr. Barry Parker and Raymond Unwin, on the laying-out and planning of cottages on areas on the outskirts of a town, where garden space must be limited, are well worthy the perusal of land owners and the profession. The authors' scheme is ingenious, though the same idea has been advocated in other forms. Two diagrams are shown: one shows the usual plan of building the cottages on an estate in straight rows of semi-detached houses towards the high roads bounding the land on the south and east, while behind are a number of parallel rows of cottages, with their small yards and out-buildings, and bounded by a railway embankment on the north and west sides. The plan is typical of many new estates, with their dreary backs towards every intermediate road. The authors ask, "Must this be accepted as inevitable, then? Is it a necessity which dictates that cottages should have no better prospect in front than that afforded by the row of houses across the street, or at the back, than that presented by their own and their neighbours' back yards? Is it necessary that half the houses should face up the hill, and that those at the corners of streets, or otherwise more advantageously placed, should have their prospect in most cases bounded by the railway embankment? Above all, is it necessary that half the houses should face north, and have their best rooms sunless?" The authors show by a second diagram that it need not be so; that there is no reason why half the cottages should face north and have sunless living-rooms. In this diagram the cottages are built not in straight rows, but alternately advanced and recessed from each road (in plan like the billet ornament). Not one of the houses has a north aspect, nearly all face south, and the few which do not, face east or west. The arrangement gives to every house three sides open to air space, two of which are sunny sides. Thus along every roadway there is a semi-detached block of cottages followed by two gardens, and then another semi-detached block, and so on, these alternate along the road behind; each pair of cottages being approached by a footpath between the two gardens which front them. A larger scale block-plan shows this arrangement of double cottages and double garden between, and the plans of each pair show that the living-rooms have windows on the three open sides, and so obtain the full benefit of all the available sunshine; the sculleries are also on the sunny side, and the waste-pipes from sink and baths are open to the sun. Two bedrooms in each house have sunny aspects. In this way, on an area of 30 acres, every room is open to sunshine, not one faces exclusively north, and very few face east or west. "The whole have a

southern frontage, with their living-rooms, sculleries, and two bedrooms facing south, and their front doors opening into their living-rooms also on the south side." The plans given are certainly compact, with projecting square bays next entrances, forming porches externally with seats inside, and a large fireplace with seats on each side of living-room range. By small open yards under the main roof, outbuildings are dispensed with, and the equal of the typical back is avoided. Other advantages are secured by the plan illustrated. This mode of arranging the houses in and out does not entail any more space than if they were built in a continuous row, and they occupy less space than the semi-detached blocks. Draughty gaps between the houses are avoided. By this plan all the land available for each house is concentrated in a square compact garden. Each pair of gardens is thus surrounded on three sides by the blocks, the front or footpath side being alone open—in fact, each pair of gardens is bounded at the sides by adjacent cottages on the front row, and behind by the entire frontage of the pair of cottages forming the back row. The gardens thus only require to be fenced off from the road; the space inclosed thus becomes on three sides a walled garden. The external elevations would present a broken line of houses advancing and receding alternately; it would present a change of light and shade of building and garden; each recess or garden would have a fresh interest for the passer-by. Artistically the treatment is an immense improvement on the long, monotonous rows of houses built on one line of frontage. A charm of varied light and shade and gabled arrangement would be the result of this mode of arrangement.

BREAKWATER CONSTRUCTION.

THE Buffalo Breakwater, New York, appears to be a massive structure of its kind, according to an elaborate description given in the November issue of the *Proceedings of the American Society of Civil Engineers*. The design of the work is a radical departure from the previous monolithic structure. Major Symons, the engineer, has adopted "a shell construction, consisting of inner, outer, and cross walls, the internal space being filled with rubble, and the whole covered with a heavy parapet deck of concrete. The walls were founded on large concrete blocks with their bases laid 2 ft. below mean lake level." The whole width of base of highest part of section is 24 ft., the front is battered to a slope of 4 to 1, and the weathered top is 19 ft. wide, the height above mean lake level being about 12 ft. On the harbour side there is a projecting part with sloped deck about 12 ft. wide and 4 ft. high above the lake level. The first concrete block of the breakwater was laid in August, 1899. American Portland cement was used, the brands being the Wayland and the Lehigh. "The block concrete contained 1 part of cement, 2 parts of sand (of which one part was stone crushed sand), 2 parts gravel (1 part granolithic), and two parts of broken stone. The exposed faces of the lake and harbour blocks for a thickness of 3 in. to 6 in. were made of granolithic concrete." The concrete was deposited in the moulds in 6 in. layers, each being tamped before the successive block was put on. On the face blocks a 4 in. piece was left upon face side, while the regular concrete was being dumped, bevelled, and partially tamped. It was then drawn out and the face filled with granolithic concrete. The whole mass was then thoroughly tamped together. The moulds were of 2 in. pine, planed and matched, and the frames of 6 in. and 8 in. timbers held together by iron tie-rods. Various sections and photo. illustrations of the new and old breakwaters are given in the paper, showing the progress and completed state of the concrete superstructure, which are of interest. The paper is by Mr. Emile Low, M.Am.Soc.C.E., to be presented on the 16th of the present month.

FLOODING OF LONDON BASEMENTS.

SIR BENJAMIN BAKER presided, on Wednesday night, over a meeting of the Sanitary Institute held at Parkes Museum, and at which the subject for discussion was "The Floodings of Basements in London by Sewage." The debate was opened by Mr. Maurice Fitzmaurice, C.M.G., the engineer to the London County Council, who said that the question really involved the whole

matter of the drainage of London, and he pointed out that this was in the hands of both the County Council and the borough councils, and that the two sets of drains and sewers were independent. If the County Council sewers were unable to carry away the drainage, the local sewers would be overcharged, but the local sewers might be overcharged and inadequate, leaving the County Council's sewers with little in them. The floodings in basements, of which so much complaint had recently been made, were due in the first place to the exceptional rainfall of the present year, and in the second case to the rapid covering of undeveloped building land, and the consequently increasing strain upon the sewers in the event of exceptional or rapid rainfall. In the case of the first cause, it was impossible to provide against an unusual rainfall such as only happened once in a century; but with regard to the second class of floodings, he pointed out that the County Council by increasing the number of intercepting and outfall sewers, were doing the best to cope with the evil, but that the Council's work would be of no avail if the local authorities did not take care that their sewers, in turn, were capable of dealing with storm waters. He thought, moreover, it should in the future be insisted that all basements in low-lying districts should be made water-tight, and that no drainage should be permitted from them. Mr. Fitzmaurice's address was followed by a paper read by Dr. Kenwood, Medical Officer of Health for Stoke Newington, who, accepting the assurances of Mr. Fitzmaurice that all was being done that the County Council could do, and that it was being done as rapidly as possible, said he would not blame the County Council, as he had originally intended, but he thought a heavy responsibility rested on them for past delays. This question of the prevention of the flooding of basements had been left for other projects which were of much less importance, but which were more showy projects from the advertising point of view. In the highest interests of the public health this subject should have been taken in hand in preference, say, to the housing question, and it would have been much less costly. A discussion followed in which several Metropolitan medical officers of health took part, several of the speakers insisting on the need for forbidding basements altogether in houses built on low-lying parts.

TOWN SUBWAYS.*

By R. M. PARKINSON.

[WITH ILLUSTRATIONS: SEE PP. 794, 811.]

THERE is no doubt that the prevention of the constant opening up of the roadway in our busy streets is becoming one of the most pressing questions of the day. No sooner has a road been widened and repaved at great expense to the community than it is often immediately broken up again for the laying of a new water or gas main, or the repair of an old one, or perhaps for the making of a single house connection. The relief given to the traffic by the widening is often more than nullified by this for a considerable time, and the effect on the finished surface of the roadway is felt for months. Three courses may be taken in dealing with an evil:—It may be remedied, mitigated, or left alone. There are cases where the cure or abatement of the evil would be worse than the evil itself, and as the existing heavy rating of town property is an element in the case it may often be advisable to adopt the last course, especially where the ground is of a treacherous nature, and where large quantities of water may be encountered, and where adjacent buildings may be injured by the necessary excavations. It is, however, impossible to generalise: each case can be treated on its own merits, and in the way the special circumstances applying to it render it best. Owing to the increased and increasing value of property in cities, our buildings have been doubled in height, while the streets have, with only a few exceptions, remained of but one story. Below the surface, however, really making a second story are generally to be found a multitude of water, gas, hydraulic mains, sewers, rain-water drains, telegraph, telephone, and electric lighting wires, tramway rails, and the like running in all directions, and often in unknown positions. Bell and electric lighting wires

* Cottages near a Town. By BARRY PARKER and RAYMOND UNWIN. Longmans, Green, and Co.

* Prize Essay on the Prevention of the Breaking Up of the Streets during the Laying of Water and other Pipes and Conduits, for the Worshipful Company of Paviers.

as well as gas and water pipes in a house placed where they can be got at—not under oak block floors laid on concrete, and at first sight it would appear that the same thing should be done in the street. The problem as to how to do it is a difficult one, and no plan can be recommended as applicable in all instances. The cases that commonly occur may be grouped under three heads:—(1) New, or comparatively new streets with macadamised roadways and paved footways. (2) Paved streets in which tramways are laid. (3) Very old streets where the cellars often extend up to and even beyond the kerb stone. Other cases there are where railways, large mains and sewers are to be found, but these must be dealt with on special lines, for it is impossible to consider every possible combination of circumstances that may occur. Having prepared the parliamentary plans for a number of the London subways, and having had considerable experience in laying water and gas mains and sewers, and having, moreover, superintended the construction of heavy works in London, both as contractor's agent and as resident engineer, the writer feels that his ideas on this matter should be of some value. He proposes first to take the comparatively simple case of a new street, where, owing to the configuration of the ground, the sewer can be laid at an almost constant depth below the surface, in order to be low enough to drain the cellars which are assumed not to project under the footway, and then to consider the necessary modifications that must be made in the plan should the sewer be at a considerable depth. Or should it be necessary to avoid the footway and place the subway in the roadway, either near the surface or deep down or under a tramway, he then intends to take an imaginary old street, and to deal with it at various points, starting with an ideal section and modifying this to meet certain difficulties at various points. However simple or however complicated the system may be, the first thing to be done in treating any case is the preparing of an accurate plan to a scale of perhaps 8ft. to an inch, to show the positions and levels of all the mains and connections and the houses and cellars abutting on the road, as in Fig. 8. The first difficulty that occurs is a legal one. It appears to be the law that in certain, if not all, cases half the street belongs to the frontager, and that the public have only a "right of user"; but, on the other hand, it has been held that where a cellar projects under the roadway, the ground below does not necessarily belong to the owner of the cellar. To settle this question and to authorise the construction of subways everywhere, a general Act of Parliament is required, and some strong clauses should be inserted as to compensation, giving the arbitrator power to take into consideration the probable improvement in property in assessing compensation for the taking of a cellar or part of it as in the case of the Light Railways Act of 1896. This should be fair, and the community should be protected against exorbitant claims and endless litigation. To this end the compensation should be fixed by an official arbitrator, not by a too-generously-minded jury. It is best to avoid touching the cellars; but there are cases where this is impossible, as in Bath and many streets in London. The writer once came across a cellar in the City which projected not only right under the street, but even under a house of different ownership opposite. There should be a provision in the Act for providing new cellar accommodation, perhaps at a lower level, to meet such a case as this: otherwise the amount of compensation, really fairly due, might be enormous. It would perhaps be hardly possible of fair to make the gas and water companies, or the frontagers themselves, pay for any large proportion of the improvement; but a charge should be made, calculated on the estimated saving in the repairs in the case of the companies, while the frontagers ought to pay for access to the subway, the tramway in which could be utilised for the removal of the ashes and other purposes. However constructed, the following requirements must be satisfied in every subway:—(1) Sufficient room must be left round the mains to enable the pipe-jointers to work. This should be 4in. for spigot and socket iron pipes, and 2in. for flanged and stoneware pipes. (2) Sufficient room (10in.) must be left between the mains to enable the pipe-jointers to crawl to the other side, and sufficient head room (3ft.) must be there given them to work in. (3) Sufficient room (21in. by 6ft.) must be left to enable men to walk upright along the subway, although in certain cases this rule may

be modified. (4) Accommodation for bringing in the largest pipes used must be given in the form of a tramway, which ought to run down to a canal or railway. In London every system should, if possible, start from the river, where the material excavated can best be got rid of, and where ballast and cement can be obtained most cheaply. (5) Provision must be made for getting rid of surface water, especially where the soil is water-bearing. (6) Sufficient room must be provided, so far as it is possible to estimate it, for all existing and possible additional mains. Besides the ordinary sewers and large mains, there are often low-level sewers, service mains, and a multitude of other things to be dealt with. The following will give some idea of what may be found in a street: Sewers for surface water, sewage (high and low level) and their connections to the houses, gullies, and ventilators; water mains, large and small, and their connections to the houses, hydrants, and flushing tanks; gas mains, large and small, and their connections to the houses and street lamps; hydraulic mains and their connections; electric lighting and power-feeders to telegraph and telephonic wires and their connections to the houses, tramways, &c.; pneumatic tubes and air tubes in connection with Shone's ejectors; railways and deep subways; cellars, lavatories, and street crossings; tramways and their bonding wires. Eight schemes for dealing with the matter are submitted. These are illustrated by the accompanying drawings, which it is necessary to first describe.

GENERAL DESCRIPTION OF THE VARIOUS PROPOSALS AND DRAWINGS.

Eight schemes are given. Except in Figs. 4 and 7, where the logs can be removed, sufficient room is everywhere given for taking in the largest pipe that can be used on a tram-line, as in requirement No. 4. Except in Figs. 3 and 4, sufficient head room (6ft.) and width (1ft. 9in.), except at the joints, as in Fig. 5) is given for a man to walk upright, to comply with requirement No. 3. A space of 10in. is given between the pipes for a man to crawl through to work on the other side, and as much room as possible is allowed for him there. Fig. 12 leaves something to be desired in this respect; but, under the conditions, this is unavoidable. In certain places the water pipes must be covered either with fine sand, felt, or other composition to keep out the frost; but the temperature in a subway is rarely low enough for this to be necessary. In Fig. 5 the water mains are covered with sand, and in Fig. 4 with silicate cotton. The water from the hydraulic mains is generally wasted, and so cannot be mixed with glycerine; so these pipes require the same protection, if any, as the water pipes. Figs. 1 and 2 are cross and part longitudinal sections respectively, of a subway under the pavement where the sewer is at a reasonable depth, and relate to scheme No. 1. Figs. 3 and 4, scheme No. 2, constitute a cross section of a street where the sewer is not dealt with. Figs. 5 and 6 are sections of a subway under the roadway, the one, scheme No. 3, being near the surface, and the other, scheme No. 4, deep down or in water-bearing strata. Fig. 7, scheme No. 5, deals with a tramway. Fig. 8 is a plan of an imaginary old street; and Figs. 9, 11, and 12, schemes 6, 7, and 8, are cross-sections of this at various places, Fig. 10 being a part longitudinal section of Fig. 9. It is necessary to make the stability of the side walls independent of any support they may get from the earth behind them, as the ground may at any time be excavated for cellars; otherwise an arched roof might be substituted for the girders in Figs. 9 and 10, where sufficient depth could be obtained. More pipes are shown than are ordinarily met with; but they are so shown in order to illustrate the maximum capacity of the subway.

SCHEME NO. 1 (FIGS. 1 AND 2).—DEEP SUBWAY UNDER THE FOOTWAY EMBRACING THE SEWERS.

Fig. 1, cross section; Fig. 2, part longitudinal section. Width, 6ft.; height, 7ft. 6in.; walking space, 1ft. 9in. by 6ft. 3in.; internal diameter of largest possible pipe, 18in. It is assumed that the street has a fair gradient, so that the sewer can be at a nearly constant depth between the surface, and that this must be able to drain cellars 7ft. below the kerb. The sets-back in the side walls are to provide for carrying the centres in the first instance, and the wires and pipes afterwards. The small pipes are carried on straps let into the walls, the large water main on concrete supports 12ft. apart, and the large gas-

main on rolled joists supported by brickwork. Small angle irons are riveted to the rolled joists to take the thrust of the wedges which tighten up the packing blocks provided to hold the pipes secure. A width of 16in. is given between the pipes and the wall to enable the pipe jointer to work. The 4in. pipes on the one side and the supports to the 18in. pipes on the other render a larger gauge than 16in. for the tramline impossible, or 24in. would have been better. Nine-inch glazed pipes are put at intervals in the right-hand wall for the house connections on the other side of the street. As these must, for the reasons given below, be above the top of the sewer, and a rise of at least 6in. must be given in the width of the street, the cellar floor on the right-hand side cannot be much more than 5ft. below the kerb. It is evident from the figure that, so long as plenty of pipes are built into the wall, the making of the connections on the left is a simple matter. It is almost as easy to make them on the right without disturbing the surface. A 4in. steel tube for the soil-pipe and a 3in. tube for the electric mains and the gas and water pipes can be driven across the road in practically the same way as a boring is made for purposes of water supply, a special plant with short tubes and boring tools being provided, together with a powerful hydraulic jack. The stop to the 9in. pipe would first be broken, and then a 6ft. tube and boring tool inserted, the left wall being used as a base to work from, while the traffic on the tramway would be stopped for the time. Access should be provided by iron locked doors placed over the tramway near the supports to the large pipes, which could be utilised as steps. At intervals spaces 13ft. long and 27in. wide should be left in the roof, to admit of the introduction or removal of the pipes, iron girders being used instead of the concrete arch for the purpose, and the flags being laid on these in the same way as they rest on the side walls in Fig. 4. The tramway could be utilised for certain purposes if there were openings to the cellars, and would be very useful in such a street as Paternoster-row, which is always blocked by waggons. If the traffic was likely to be heavy, the working would have to be done by the authority, and by electric traction inwards and outwards, goods being dealt with at different times of the day, and turnouts provided into the cellars, the 4in. water mains being raised or lowered for this purpose. The tramway should lead to some distributing centre within a reasonable distance, where the congestion in the streets is less, and, if possible, also to a railway depot. Properly worked, a narrow-gauge tramway such as this would relieve the streets to a considerable extent, and often render their widening unnecessary. The only cost would be the provision for traction for the tramway itself, and the space it occupies is absolutely essential for the purposes the subway is intended to be constructed for.

SCHEME NO. 2 (FIGS. 3 AND 4).—SHALLOW SUBWAYS UNDER THE FOOTWAYS NOT DEALING WITH THE SEWERS.

Fig. 3, cross-section of main subway; Fig. 4, cross-section of secondary subway. Main subway 6ft. wide, 4ft. 9in. high; secondary subway 2ft. 6in. wide, 2ft. 7in. high; walking space of main subway 1ft. 9in. wide, 4ft. 3in. high; internal diameter of largest possible pipe 15in. The arrangements here explain themselves. The roof is composed of 3in. York flags resting on concrete arches 3ft. apart. Two of these arches would have to be omitted at intervals, and replaced by removable steel joists to enable the 12ft. pipes to be lowered. In addition iron inspecting openings should be put to provide access. The York flags in Fig. 4 should be easily removable, holes being let through them for inserting the T-pieces for lifting them off. When raised the flags should be stood on edge to save space, and act as a fence on the pathway side, and they should be secured by rods fixed in the lifting holes.

SCHEME NO. 3 (FIG. 5).—SUBWAY IN ROADWAY NEAR SURFACE.

Width 7ft.; height 8ft.; walking space 21in. wide, 6ft. 2in. high; internal diameter of largest possible pipe 24in. There is room here for an 18in. gauge tramway over the sewer. Surface water drainage is provided for. The house drainage, &c., are, as before, driven with well tubes. The electric mains are carried on ledges in the channels on either side, iron pins being placed at 3ft. intervals to keep them from falling on to the ledge below. The small pipes are hung up from above, and the straps, being keyed up to a true

line, do not require any adjusting. The smaller water pipes are laid in sand, but the large water main would have to be covered with a non-conducting substance if any danger from frost were to be apprehended.

SCHEME NO. 4 (FIG. 6).—SUBWAY UNDER ROADWAY, DEEP DOWN OR IN WATER-BEARING STRATA.

Diameter in clear 7ft.; walking space 2ft. wide, 6ft. 6in. high; internal diameter of largest possible pipe 21in. This construction is copied from the system in use on the Central London and other similar railways. The large pipes are hung up from the flanges by straps and adjustable bolts, and the smaller ones are supported by straps resting on these as cantilevers. The wires are carried on tiles set in concrete, with which the lower part of the segments is covered; some can also be placed in the channels above the sewers. There are two sewers, the second being provided to enable the tram-line to be laid near the bottom. They could be connected by reducing the headway given for a short distance. In this case the track carrying the pipes would have to be set lower. In the middle plate, each side, holes are left for the house connections. These are nearer the top or bottom of the plate, according to the way they are placed, to enable the tube to be driven in various directions. These holes are covered by plates, which can be removed when it is desired to make a connection. They can then be replaced by plates with stuffing-boxes in water-bearing strata, and the work done under pressure, power for the operation being obtained from the hydraulic or electric mains in the subway and a special air tube. Where water is present, it is better to drive one large tube, in which the 4in. and 3in. tubes can afterwards be placed.

SCHEME NO. 5 (FIG. 7).—SUBWAYS UNDER A DOUBLE-LINE TRAMWAY.

Total width, 12ft 4in.; height, 6ft. 3in.; walking space, 3in. wide by 6ft. high; internal diameter of largest possible pipe, 36in. Here there is room enough for a 24in. tramway, but 36in. pipes would have to be lowered into their position from the top, the largest pipe that could be brought in on the tramway being 27in. in diameter. The sewer is placed right under the subway, which drains into it by gulleys placed at intervals. Should the sewer or house drain require attention they must be reached by means of headings driven in the ordinary way usual in tunnelling. The centre rails of the surface tramway are carried on concrete arches, 10ft. 6in. span, 2ft. rise, 15in. deep by 12in. wide, supported by piers 18in. long by 12in. wide, and so 12ft. centre to centre. The special feature in this scheme is the way the flooring is dealt with. The wood blocks are laid in iron troughs, composed of 3in. buckle plates, stiffened by 3in. by 3in. by 1/2in. Ls., 2ft. apart. The bottom is levelled over with lime concrete, and the blocks are then placed at the right level on sand. These troughs, which are in 6ft. sections, can be taken out bodily when any repairs to the tramway are necessary. They rest through the medium of felt and wood packing on the lower flanges of the rails, which must be 7in. deep, and to these they are firmly fixed by bolts and lock nuts to hold them firmly down. Outside the rails the blocks are secured in angle iron frames held down by bolts. These movable troughs are chiefly wanted at the rail joints, where access to the bonding wires is sometimes necessary. When the saving in headway and consequential excavation is taken into consideration, it will be seen that they are useful in any case on the ground of economy. It will be seen from the section that the rails can be packed from below should they get slack; but in the way they are shown to be laid this would hardly be necessary.

SCHEMES 6, 7, AND 8 (FIGS. 8 TO 12).—SUBWAY IN AN OLD STREET.

Fig. 8 general plan, scale, 8ft. to an inch; Fig. 9 cross section, No. 6 scheme; Fig. 10 part longitudinal section, No. 6 scheme; Fig. 11 part cross section, No. 7 scheme; Fig. 12 part cross section, No. 8 scheme. No. 6 scheme 19ft. wide, 13ft. high; No. 7 scheme 9ft. 6in. wide, 12ft. high; No. 8 scheme 31ft. 6in. wide, 8ft. 10in. high. Internal diameter of largest possible pipe 27in.; width for tramway, 9ft. 6in.; height for tramway, 8ft. 10in.; width of platform (Fig. 12), 11ft.; headway above platform (Fig. 12), 7ft. 3in.

These schemes must be considered together. They are really only parts of one. The black

lines in Fig. 8 show the existing state of things so far as they are known, the red lines the proposals. Between houses 1 and 8 the problem is comparatively simple, but between 8 and 9 a cross street is passed, and under this is a railway which absolutely fixes the level of the subway, and in addition there are the usual cross drains and pipes. The best standard form of construction where there are no special difficulties is illustrated in Figs. 9 and 10. The subway is made large enough to take a double line of tramway, on which cars of the size employed on the City and South London Railway could be run. Sufficient space is allowed at the side for a man to stand against the wall while a car is passing, and the lines are laid a greater distance apart than is required by the Board of Trade for an ordinary tramway. It will be gathered from Fig. 8 that in order to properly deal with all the existing pipes it would be necessary to excavate right across the street to a depth of, perhaps, 6ft. or 8ft., and to fill in again if such a subway as is shown in Fig. 5 was adopted as the type. The material filled in would take some time to settle, and might occasion settlements of the adjacent buildings: so it seems better to put the side walls near the kerbstones, and leave the whole of the underside of the street open. The headway required for a tramcar is not very much greater than is required in any case, and thus it seems better to spend, perhaps, 25 per cent. more money to have a profit-earning concern to pay for part of the expense, and, further, by its means to possibly save a future widening of the street. The type of tramway to be adopted would depend on circumstances. Here provision at the station is only made for cars in pairs, the platform being about 30ft. in length. As before, openings might be made in the cellars for dealing with goods traffic at certain times in the day or night. For very narrow streets the up and down tram lines might be separated, one being taken by one route, and the other by another, the section adopted being as in Fig. 11. The gauge should be from 4in. to 4in. less than the standard 4ft. 8 1/2in., if ordinary grooved tramway rails are used, so that railway waggons can be introduced. With the centre 27in. main the sides of these must not be more than 2ft. high—i.e., than 6ft. above the rail level. By referring to Fig. 8 it will be seen that some of the cellars come beyond the curve, and require special treatment. In the case of No. 4, a small portion must be acquired, and in that of No. 20 a large portion, so much, in fact, as perhaps to cripple the owner's business unless a second cellar at a lower level could be provided in substitution on the order of the official arbitrator. Cellars 6 and 7 can be avoided by curving the line, the cellar wall at 7 being incorporated with the subway wall. At 13 the cellar wall would have to be pulled down and rebuilt, but no compensation should be due for this. As the new wall would be only 14in. thick, it would be necessary to employ a longitudinal girder to support the cross girders. The railway arch in the cross street would have to be removed, and a girder construction adopted. It is assumed that the line is similar to the Metropolitan Railway, on which the minimum structure line is only 13ft. above the rails. If the street level was a foot lower than is shown, the tramway could just be got through by raising the street level a few inches, giving only 3in. clearance above the trams, and using a special construction in carrying the tramway over the railway. If the street was narrower than shown, a single-line tramway would have to be put in, as in Fig. 11. The cross girders shown in Figs. 9 and 10 are steel joists cambered to the curve of the street. They are placed 5ft. apart, centre to centre, and are made strong enough to take a pair of steam rollers moving side by side with a total load of 20 tons on their driving wheels. In Fig. 11 the smaller joists are placed nearer together, as the same depth of concrete cannot be obtained in the jack arches. The house drains would have to be laid in iron siphons in chases in the invert to pass under the electric wire channels and the 21in. main, and they might be flushed by means of valves on the house side and connections with the water main. It would, perhaps, be well to run a secondary sewer at the side under the left rail, and pump to the main sewer by Shone's ejectors at intervals. The water main is carried by concrete supports, 1ft. wide, 12ft. apart; the sewer by concrete supports on the culvert, 6in. wide, 2ft. or 2ft. 6in. apart at the collar, according to the size of the pipes used.

The gas main is suspended from the cross girders by adjustable straps. In Fig. 11 the same construction is given, but 6in. less headway is required. In Fig. 12 a further economy in headroom is gained by the use of trough flooring. The pipes and wires here remain on the left-hand side, but the large pipes have to be placed under the platform, the sewer going under the other half of the platform, which is not here shown. It so happens that it can be put at the right level for doing this, or a siphon would have been necessary. The sewer takes the place of the 27in. main under the right side of the platform, and room is left for another pipe beside it. The pipes rest on 3in. by 3in. (10lb.) rolled joists, and the flooring between is composed of 1/2in. iron plates. Access can be gained by removing part of the platform, which should be fixed with this end in view. A man can get through the 10in. space on either side of the 21in. water main to make the joints. He can do the same between the gas-main and the girder, but at the abutments of the bridge only. He would have to crawl along the narrow space allowed to get to a joint at the centre of the span. The 3ft. culvert must leave its central position at the point R: to join the drain at S, must cross under the tramway in a channel 6ft. wide and 18in. high to allow for the crossing of a future main occupying a position under this line of tramway, similar to that of the 21in. water main under the other. The 15in. sewer is to be laid from R under the platform to the manhole at U, and then to its old position at X. The 27in. gas-main must drop at L to below the platform, and rise again to its old level at V. The 21in. water main has slightly to rise to get under the platform, and has also to leave its central position under the line for this purpose. Access to the subway for both pipes and passengers is given from the street crossing at R by means of steps, in two flights, open to the light. Beyond the platform is placed the underground lavatory, which it is assumed is displaced from its original site by the works. It will be noted that the scale of 8ft. to an inch is by no means too large for showing every detail. In actual work it would perhaps be better to show the new work on tracing paper, only inserting the leading features to localise it.

(To be concluded.)

ROOFS FOR INDUSTRIAL PLANTS.

THE subject of fire-resisting roofs for machine shops and foundries has been taken up by the American Factory Mutual Fire Insurance Companies. It has long been known by those who have made a study of the causes of fire in industrial plants that the roof was the most dangerous feature of a manufacturing building as a rule. A striking example of this was furnished by the destruction of the plant of the Brown Hoisting Machinery Co. The main building belonging to this company was a brick structure with steel roof trusses supported at the ends by steel columns. The floors were of 2in. plank nailed to 4in. by 4in. stringers set in 18in. of cinders. The roof was plank covered with steel. This type of construction will be recognised at once as one which is the favourite of many mill owners, in spite of everything that architects have done to introduce better designs. In this building there was a corrugated iron gasoline tank at one end. Through the carelessness of a workman, fire was started in this tank, which spread with such rapidity that in seven minutes the entire building was in flames and soon afterwards the company's plant was destroyed.

It has been recognised for some time that a substitute was needed for the composition roof. There are, to be sure, says the *Engineering Record*, expensive brick, concrete, and steel roofs which are fireproof, but their cost is too great for them to be used in the majority of mills. There is very little to choose between the pitched roof of boards covered with slate, the mansard roof, and the roof of flat section of boards laid on joists and sheathed underneath. All of them are bad. It is interesting to learn, therefore, that Mr. Alexander Brown, of the Brown Hoisting Machinery Company, has recently brought out a type of construction which has many features of value. This design was prepared for the new plant of his company. Slate laid on light steel supports condenses moisture badly, ordinary corrugated iron is open to a similar objection, roofing tile requires a large number of purlins,

which increases the cost of the structural steel work, and concrete roofs of the usual type are very heavy. Mr. Brown accordingly devised a roof which is 1½ in. thick. Its new feature is a type of corrugated iron called ferroinclave. The corrugations in these sheets bend back on themselves somewhat so that mortar placed over and under the sheets is held by tons of the material, which fit in the corrugations. These sheets are laid much like ordinary corrugated iron roofs. On top of them a mixture of two parts of sand and one part of Portland cement is spread, and on the underside there is used a similar mixture, to which a small amount of lime and hair has been added. The cement is allowed to set for a number of days and then painted until it is water-tight. Such a roof costs about 21d. per square as against 16s. 6d. per square for the ordinary tar and gravel roof. It has been tested in the Insurance Engineering Experiment Station by Professor Charles L. Norton, who finds that it resists fire well, but has a conductivity six to eight times that of a 2 in. spruce plank. This makes the roof more liable to cause a drip than wood, but how far such an objection will extend is considered problematical at present.

A roof of this character deserves careful attention, not only from mill architects but also from the designers of buildings containing a large amount of combustible material, and the structures housing electric plants, where sprinklers cannot be put in, and where the only danger of fire is from the roof materials. In machine shops and foundries it is not at all improbable that the condensation on the inside of the roof would be of little importance, and might well be borne on account of the greater immunity from fire afforded by this system of construction. Few shop superintendents recognise how fully the roof influences the fire hazard of a building. The experience of the Brown Hoising Machinery Company, which lost a large plant of a type often considered fire-proof, should prove the necessity of paying more attention to this feature of design.

TOOL HANDLES.

A CORRESPONDENT of the *Manchester Guardian* points out that the recent advance in price of wooden handles for edged tools, spades, and shovels, which have been seriously felt both in England and America, has been neither artificial nor arbitrary, but is the direct result of a growing scarcity of American wood. The wholesale, and even wanton, destruction of forest trees in America is now making its influence felt. In America the screen door and window screen business has suffered from the practical exhaustion of the white pine forest trees of the north, and recourse has been had to the cypress and the more abundant though less satisfactory yellow pine of the south. Makers of wheelbarrows have been utterly unable to keep up with the business that has come to them, not only because of the enormous demand, but of the great difficulty in getting material. Manufacturers of handles for tools and implements of all kinds have been at their wits' end to know where to get the ash and hickory which alone seem suitable for this purpose. The makers of plumbers' woodwork, too, are feeling the scarcity of the special kinds of woods they have been accustomed to use. In fact, nearly all the manufacturing trades into which wood enters in any form are becoming embarrassed from the lack of sufficient material. It is no wonder that Americans are looking around them with considerable anxiety as to the next district from which to draw their timber supplies. The great forestry reserves of the extreme north-west, particularly Washington and Oregon, are only partly available, because of the freight charges and the lack of suitable lumber. Canada offers relief as far as quantity is concerned, but the tariff is thus far a barrier. The growth of new forest trees is a matter of one or two generations, and only a moderate start has been made in this direction. The facts emphasise the necessity for a broad policy which shall prevent the ruthless destruction of forests and look to the preservation of trees for other reasons besides the material contained in their trunks.

Even in Canada the supplies of the special kinds of timber required are not so extensive as is usually supposed, and, in any event, the Ontario Legislature is imposing an export duty upon Ontario lumber with the object of encouraging the furniture trade in that province. Both American and British manufacturers of goods in which wooden handles or other wood

components play a considerable part must therefore look to some other sources of supply than the old American forests. The British manufacturers have had it suggested to them that they should co-operatively manufacture their own handles by employing British wood workers. The American makers cannot corner the supplies of ash, for the reason that the proportion used would not make it worth while, and, in any event, there are sufficient supplies of suitable timber in Hungary and elsewhere. It has been ascertained that it would be necessary to lay down seven or eight large and costly machines, and no single English firm has a large enough sale for the products to keep such a plant fully employed. One important plant has, however, been laid down in Great Britain for cutting out "D" handles, and experiments are being made with woods other than ash, of which the supplies in Great Britain are by no means enough.

CHIPS.

The general business meeting of the Royal Institute of British Architects to be held on Monday, January 4, will be devoted by the Council to a discussion of the question of compulsory registration for architects.

A resolution has been passed by the committee of representatives acting with the Company of Plumbers, conveying their congratulations to Sir Lees Knowles, M.P., on the baronetcy recently conferred upon him, and recording their high appreciation of the public service rendered by him to the cause of public health by his advocacy in Parliament during the past ten years of the national registration of plumbers, and particularly of his conspicuous services as chairman of the Select Committee appointed in 1892.

Memorial stones were laid of a new chapel being erected by the Bible Christians at Langtree, North Devon, on Thursday in last week. It will cost about £600. Mr. Parsons, of Holsworthy, is the architect, and Mr. Bowden, of Torrington, the contractor.

The ceremony of laying the foundation-stone of the Carnegie Free Library at Levenshulme took place on Saturday afternoon. The new institution is to be built at the end of Cromwell Grove, a growing part of the township. The sum of £2,500 was offered by Mr. Carnegie in response to an appeal.

The London Water Purchase Arbitration Court has reduced the New River Water Company's claim of £13,260,164 to £7,701,617.

A party of Government surveyors commenced on Friday the survey, for building purposes, of the 160 acres of land at Dover to be occupied by the Duke of York's Schools. It is stated the building will be commenced next spring.

At the town-hall, Birkenhead, on Friday, Colonel A. C. Durnford, R.E., conducted two inquiries on behalf of the Local Government Board. The first related to the Birkenhead Corporation's application for sanction to borrow £25,367 for the erection of a depot, stables, &c., in Vittoria-street; and the second concerned proposed sewerage works, in respect of which borrowing powers to the amount of £20,000 were sought.

Preparations are being made at Ports mouth to erect a new chain cable store close to the south railway jetty. The total cost of the work will be £7,800, of which £4,000 will be spent before the end of March.

The estate of the late Mr. Thomas Alexander Pate, architect, of South Shields, and a native of Peterhead, who took an important part in the development of the borough, is entered at £5,936, including net personality £1,637.

Victoria-road U.F. Church, Kirkcaldy, was opened last week. It is of massive proportions, and is in the Renaissance style, constructed of red stone from Dumfries. The church is seated for upwards of 700. There are two halls, which have accommodation for 350 and 180 respectively. The building is lighted with electricity, and cost nearly £7,000.

The department of Egyptian archaeology of the University of Liverpool has completed preliminary arrangements for a season's excavation in Egypt. The necessary firm has been received from the Egyptian Government, and part of the staff is to sail at once for the scene of the work. The fruits of the excavations made last year by Mr. John Garstang, of Liverpool University, at the Necropolis of Ben Hasan, have now found their way into the departmental museum university. The forthcoming expedition will, in addition to carrying on operations at the Necropolis of Ben Hasan, make excavations at the great tomb at Negadeh, which is regarded by French explorers as that of Nenes, the first of all the Kings of Egypt.

Building Intelligence.

BIRMINGHAM.—The Theatre Royal is about to be rebuilt at a cost for erection and equipment of upwards of £50,000. The architect is Mr. Ernest Runtz, of the firm of Runtz and Ford, Walbrook, E.C. The building will be five stories in height, and of red brick or terracotta with stone facings, the elevation to New-street being in a Free treatment of the Renaissance period, surmounted by a group of statuary. The principal entrance—that for the dress circle and stalls—will be at the corner of New-street and Colonnade-passage, while the four front shops with offices above will extend from this point towards Temple-street. The entrance leads into a crush-room, 22ft. by 19ft., from which a staircase on the right will afford access to the dress circle, and another on the left will descend to the stalls. The box office is placed on the right of the crush-room. The stalls and dress circle have a wide corridor at the back, in which are arranged retiring-rooms, and from which are the stairs to the lower exits. The area of the house is divided into stalls, pit stalls, and pit, with two exits from the former, and three from the latter. There are also two large refreshment rooms. Behind the dress circle is a foyer, in which a special feature will be a raised alcove. The position of the auditorium has been changed. In the old theatre the audience sat with their backs to Temple-street, and faced the stage, which was on the Colonnade-passage side; but in the new building the stage will be on the Stephenson-street side, and the audience will sit with their backs to New-street. The seating accommodation is for 2,260 persons, and is apportioned as follows:—Stalls 230, pit stalls and pit 520, dress circle 350, upper circle 440, boxes 48, and gallery 672. Provision is made for twelve private boxes. The proscenium opening is 34ft., and the stage itself is 73ft. wide, with a total depth of 48ft. In the old theatre the stage was the largest in the country, with the exception of the one at Drury-lane; but the new stage will not be so big. The dressing-room accommodation is protected by fire-resisting staircases to the street. The house is to be lighted by electricity, and heated and ventilated on the Plenum system. The proscenium will be fitted with a fire-resisting curtain, and there will be an installation of hydrants on the various floors, both behind the curtain and in the auditorium. The whole of the staircases will be fireproof construction, with hand-rails, and inclosed on all sides by brickwork walls.

BIRMINGHAM UNIVERSITY.—Within a few weeks building operations in connection with the erection of the second and more important section of the Birmingham University new buildings will be entered upon, and within a period of nine months, according to the terms of the contract, one portion of the main structure is to be completed. Messrs. Smith and Pitts, of Balsall Heath, the builders who secured the contract for the erection of the power station, have practically completed this work, and the more extensive work of putting in the foundations, which was let to Mr. Thomas Rowbotham, contractor, Small Heath, will very shortly be finished. The cost of these foundations will be something like £70,000. The work includes the construction of the basements, kitchens, and subways, these rising to a height of 13ft. 6in., and the superstructures thereon rise to a further height of 18ft. 6in. In fact, at the present time a considerable portion of the building is nearly half completed. The work has been in hand about fifteen months, and for a long time some 500 operatives were employed daily. To accelerate the job the contractor has now upon the ground up-to-date machine plant. The tenders for the further superstructures, internal finishings, and other work will shortly be dealt with by the architects, Messrs. Aston Webb, R.A., and E. Ingress Bell.

CHELTEMHAM.—When the assembly-rooms at Cheltenham, which were opened in the year of Waterloo by the Duke of Wellington, gave place, four years ago, to new banking premises, the demand which had long been felt for a rendezvous for the many social functions and public gatherings characteristic of the life of a progressive pleasure resort became a matter of urgency. The town council, laying aside more ambitious schemes for the conversion of the winter garden—an immense glass structure ill-adapted to the demands necessarily made upon its use—into a

modern kursaal or for the combination of assembly rooms with new municipal offices, turned its attention to the immediate provision of a building that should answer in every respect to the social requirements of the town. The result has been the erection, to the plans of Mr. F. W. Waller, of Gloucester, of a hall of Classic Renaissance character, grouped around which is a suite of rooms with every accommodation for service. The hall, which was opened on Saturday by Sir M. Hicks-Beach, will give accommodation to an audience estimated at 2,500, and the floor has been specially constructed on girders and spiral springs for dancing. There are also large drawing and supper rooms, with refreshment, smoking, and cardrooms. The total cost has been £50,000. Messrs. Collins and Godfrey, of Cheltenham and Tewkesbury, were the contractors.

CHICHESTER CATHEDRAL.—The committee appointed to consider the best form of memorial to Archbishop Mount have decided to recommend the re-erection of a screen in Chichester Cathedral. Early in the 16th century a screen of carved oak, rich with gilding and colouring, was erected in Chichester Cathedral behind the high altar, so as to separate the choir from the retro-choir, or presbytery. The lower part was solid, with a door on each side of the altar, but the upper part was probably of open work, so as to allow a view from the choir of the triforium above the entrance to the Lady-chapel. At some subsequent period, however, pieces of thin wood were nailed over the upper part of the eastern side of the screen, which hid the carving, as far as the upper part of it was concerned, from a spectator standing in the retro-choir. About 1759 much of the portion of the screen immediately above the altar was cut away, and an arched panel filled with crimson velvet was substituted, having in the centre the monogram "I.H.S.," surmounted by a circle of rays, all worked in gold thread. In 1886, therefore, the late Canon Swainson proposed the removal of the screen altogether, and the erection in its place of a stone and marble reredos to the altar. This reredos was to have consisted of three portions, each crowned by a gable; the central and highest portion immediately behind the altar, and those right and left of it extending to the walls of the choir. The ancient screen was removed, and its fragments stowed away in various parts of the cathedral, and the central portion of the new reredos was erected. But no sooner was it placed in position than it was recognised that it was out of harmony with the architecture of the church, and also blocked out the view of the triforium of the retro-choir even more completely than the old screen. Canon Swainson, therefore, made no further effort to complete the design, and the two side portions were never added, their places being filled by curtains. Some of the woodwork of the old screen has disappeared, but enough remains to allow of its complete reconstruction as it was originally erected, excepting the central portion, which was cut away in 1759.

GLASGOW.—The Moss's Empires, Ltd., have acquired a site and have instructed their architect, Mr. Frank Matcham, of London, to prepare plans for a new theatre of varieties in the south side of Glasgow. The building will have extensive frontages to Eglinton, Herbertson, and South Coburg-streets, the main front being to Eglinton-street. The building will have accommodation provided for some 3,000 to 4,000 people. The auditorium will be 90ft. square, and will contain stalls, pit, circle, and a large gallery. The circles will be constructed on the architect's patented, curvilinear, cantileverage construction, no columns being used. Waiting-rooms will be provided for each separate part of the house. The interior decorations will be executed in fibrous plaster, and the hangings will be in silk plush. The stalls and circle will be fitted with tip-up chairs. The building will be constructed of fireproof materials and illuminated by electric light. The Moss's Empires are also entirely redecorating, refurnishing, and making additions to the Glasgow Empire, and the work, which is being carried out under the direction of their architect, Mr. Frank Matcham, will be completed by Christmas.

LONDON COUNTY COUNCIL.—At Tuesday's weekly meeting, an estimate of £61,000 for the acquisition of a site for an electricity generating station in Pimlico and of a site for the housing of displaced working-class residents was approved. On the recommendation of the Housing of the Working Classes Committee the tender for

£18,861 of the Haslemere Builders, Limited, was accepted for the erection of Wenlake-buildings, Roby-street, St. Luke, in connection with the Garden-row, St. Luke, Improvement Scheme, 1899. Replying to a question, Mr. Robinson (chairman of the Establishment Committee) said that the Sites Committee did not think the present a prudent time for bringing forward any large scheme for housing the Council's staff. The Government was desirous of knowing the views of the Council at an early date as to the vacant land opposite the county-hall, but they would not take any action without giving the Council the opportunity of considering the matter further. The question of purchasing tramway rails in Belgium gave rise to a long discussion. Lieut.-Colonel Rotton moved that the Highways Committee ascertain the hours and rate of pay of the Belgian workmen engaged on the Council's rails, and whether there was Sunday work. To this an amendment was proposed, extending the inquiry to all foreign workmen engaged on rails for the Government and provincial corporations, as well as for the Council. This was carried.

LEITH.—Some eight months ago the New Gaiety Theatre, Leith, was closed, the property having been acquired by the Grand Theatre and Opera House, Glasgow (Limited). At the same time other premises in the Kirkgate, and adjoining the old theatre, were purchased, and since then a scheme of construction has been carried out, so that the buildings have been entirely metamorphosed. The accommodation has been more than doubled by gutting the interior, heightening the roof, and erecting two galleries. New furnishings have been introduced, the stage has been enlarged, and the entrances increased. Altogether, there is now seating accommodation for 2,000 persons—in the pit, pit stalls, and orchestra stalls, 900; in the dress circle, 300; and in the gallery, 800. There are also three tiers of boxes on either side of the proscenium. In the centre of the proscenium there is a painted subject, symbolic of the drama and poetry, above the names of Shakespeare, Burns, and Scott. The proscenium front to boxes and the main ceiling are constructed in ornamental fibrous plaster work. On each of the floors there are bar-rooms and smoking-rooms, and, in addition, at the dress circle there are ladies' rooms. The galleries, built on the cantilever principle, are constructed entirely of steel and concrete, and, along with the staircases, are fireproof. A special staircase runs right up to the gallery, to be used only in cases of panic. The whole building is lighted by electricity. The plans were prepared by Baillie Davidson, architect and measurer, Coatbridge, under whose personal superintendence the work has been carried out. The new theatre, which was opened on Monday, has cost, including site, reconstruction, and furnishings, £25,000.

MAIDSTONE.—On Wednesday week the Archbishop of Canterbury visited St. Michael's Church, and dedicated the apse which has been presented to the church by the Arkcoll family in memory of the late Miss Arkcoll. The memorial forms a side chapel, built into the north transept. The work has been carried out by Messrs. R. Corben and Co., in accordance with a design by Sir Charles Nicholson, Bart., of the firm of Messrs. Nicholson and Corlette. The material used is ragstone, faced with Corsham stone, with panels of flint. The interior stonework is chalk from the Boxley Hills. This is the first time in the memory of the oldest Maidstone stonemason that chalk has been used for this kind of work. The scheme has included the reflooring of that portion of the church, marble being used. There is accommodation in the apse for 36 people. The reredos and altar screen are of carved wood, and it is lit by the two stained-glass windows which were formerly in the part of the old wall which had to be cut away.

MANCHESTER.—The new head offices of Parr's Bank, situate in Spring-gardens and York-street, Manchester, were opened for the first time on Saturday morning last. The exterior of the building, which is designed in Victorian Renaissance style, is of red Carlisle stone, the roof being of green slates and the dome surmounting the tower of copper. The bank occupies the whole of the ground floor and basement. The latter floor is practically in two portions, one portion being given up to the various strong-rooms, the other half to the various rooms usually assigned to the clerking staff of a large bank. The ground floor is handsomely decorated, the whole of the interior being lined with marble,

and all the woodwork being of dark stained mahogany. A feature of the banking chamber is the saloon roof over the clerks' portion. This roof is treated with enriched fibrous plaster work and leaded glazing. The large windows of the bank are framed in bronze. The whole of the upper floors, three in number, are divided up into offices for letting. The contractors for the building are Messrs. Neill and Sons, Manchester, and the architects Messrs. Charles Heathcote and Sons, also of Manchester.

OXFORD.—On St. Andrew's Day the parish church was reopened, after having been restored at the sole cost of Mr. H. J. Allcroft, of Stokesay Court. The chancel is of 13th-century date, and the nave, including chancel arch, is of the 12th century. None of the original windows exist. Each side of the 15th-century tower was recently found to be cracked the full height of the wall from the ground upwards in several places. The solid portions of the walls at the sides of the cracks have now been bonded together with long stones from the inside face, and strengthened. The beams supporting bells and the roof of the tower have been renewed in parts, and strengthened with iron straps and bolts. The lead gutters to the roof have been recast and laid to proper falls, and the roof itself covered with slates, in place of the former zinc sheets. The bell frame has been braced with timbers down to the first-floor level. The walls of the nave and chancel have been repaired, the foundations underpinned, and the exterior surface repointed; and the roofs have been made weather-proof. A concrete channel has been formed around the outside of the walls at ground level, faced with stone, laid to falls. Inside the church the floor has been taken up and the soil excavated, and a bed of concrete spread over the surface, under new oak floors and seats, and stone and brick paving in the passages. The deal pews have been replaced by English oak seats, with the exception of the 17th-century oak pews, which have been repaired and fitted up again at the west end. The 16th-century pulpit has been repaired. New English oak seats and fittings have been put in the chancel in the place of the modern deal ones. The interior surfaces of the walls have been repaired and treated with colour-wash. The work has been carried out under the auspices of the Society for the Protection of Ancient Buildings, London, and under the personal supervision of Mr. William Weir, architect.

A Local Government Board inquiry has been held at Wakefield into an application of the city council to borrow £2,250 for the purchase of a site at Alverthorpe for an infectious diseases hospital.

The town council of Durban, Natal, adopted, on Tuesday, plans for a new town-hall to cost £300,000.

The Mayor of Westminster, Mr. T. Walter L. Emden, past President of the Society of Architects, is to be appointed to represent that city on the London Water Board, in the place of Colonel Probyn, resigned.

Mr. Robert William Hammond, late chief surveyor to the War Department, died on Sunday at his residence, 73, Lee-road, Blackheath, of pneumonia, aged 72 years.

In the case of the application made on behalf of William Purkis, Braintree, Essex, builder, the order of discharge from bankruptcy has been granted, but is suspended for two years ending Nov. 11, 1905.

In the Court of Appeal, on Tuesday, Lord Justices Vaughan Williams, Romer, and Stirling gave judgment in an appeal of the South Metropolitan Gas Company against a judgment of Mr. Justice Joyce upholding a claim by the London County Council of the right of its examiners to test the appellants' gas on Sundays. Their lordships dismissed the appeal with costs, and affirmed the finding of the Court below.

At the town-hall, Gravesend, on Wednesday week, a Board of Trade inquiry was held into the circumstances of the explosion of a pipe which occurred at the works of the Tower Group Cement Manufacturers in August, and which resulted in the death of two men. Mr. Howard Smith, barrister-at-law, and Mr. G. Fullerton Bell, engineer, sat as commissioners. The commissioners decided that no blame was attached to the firm or to the employés, and that the men themselves had not taken proper care, and had filled the pipe with steam in too great a hurry. The explosion was caused by water-hammer action.

The new schools, Ipswich, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

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ILLUSTRATIONS.

NATIONAL SILVER MEDAL DESIGN FOR A REREDOS.—A COTTAGE IN WARWICKSHIRE.—ORGAN CASE, ST. BRELADE'S, JERSEY.—THE MANSION HOUSE, ROSEHAUGH, N.B.—IMPERIAL COURT, ALBERT GATE.—ROYAL INSURANCE OFFICES, SHREWSBURY.—TOWN SUBWAYS.

Our Illustrations.

NATIONAL SILVER MEDAL DESIGN FOR A REREDOS.

The explanatory notes on the drawing give several particulars. There is a note which specifies the materials of the reredos, and baldachin, which is intended to be of oak, painted and gilded. The lower stage on which it rests, also the altar, and shelf are shown in marble. The cresting of the projecting canopy is supported by corbels in the form of kneeling angels, which are supposed to be suggesting the prayer "Save, Lord, and hear us, O King of Heaven," which is on the scroll. On the side wings is the Sanctus, and the figures are intended for the Company of Heaven. These would be in gesso and very low relief, and coloured. The centre panel is a painting of the Crucifixion, executed in dull red colours, and on either side are the Blessed Virgin and St. John. The small figures in the niches represent the Early British Saints, to whom the English Church owes so much—SS. Aidan, Finan, Chad, Bede, Swithin, &c. Mr. J. Harold Gibson, A.R.I.B.A., of Manchester, is the author of this interesting scheme, for which a national silver medal was awarded this year.

COTTAGE IN WARWICKSHIRE.

The drawing explains itself. In planning this house a large living-room and a large bedroom were considered essential. The bathroom was made larger than usual, in order that it might serve as an emergency bedroom. The materials proposed to be used are sand-faced bricks, with white cement stucco above, and strawberry red tiles for the roofs. Mr. C. Pitwood Carter is the architect.

ORGAN CASE, ST. BRELADE'S CHURCH, JERSEY.

The position of the organ was a very difficult question, the chancel aisle being too interesting and beautiful a feature to block up. It was eventually decided to place it in the south transept, where originally was a gallery set apart for the police, a body which in Jersey is elected by each parish, and is unpaid, but to belong to which is held to be an honour, if not a pleasure. The space under the organ-chamber is used as a vestry (the double doors leading to it being shown on the drawing). The organist sits and plays in the small recess on the left, which adjoins the chancel screen, and whence, by means of a looking-glass, he can command the choir. The architects are Messrs. Rogers, Bone, and Coles, of Carteret-street, S.W.

ROSEHAUGH.

The building of which these sketches represent various portions has been recently completed, the whole of the general contract being carried out by Messrs. Foster and Dicksee, of Rugby. The building is built of stone from local quarries, the dressings and all architectural

features being in grey sandstone from a quarry on the site, and the general walling of red sandstone from a quarry in the neighbourhood. Internally, the various rooms have been finished in distinctive styles, of which we illustrate two of the bedrooms, one in the Jacobean style, and the other in the Elizabethan style, the fireplace shown in illustration having originally belonged to the old palace of James I., Bromley, Kent. Throughout the house many fine examples of antique chimneypieces, doorways, tapestries, and other works of art have been fitted up. In fact the house is largely a museum of antiquities. The architect was Mr. Wm. Flockhart, F.R.I.B.A., New Bond-street, London, W.

IMPERIAL COURT, BROMPTON ROAD, W.

THIS building, in course of erection close to Sloane-street, has frontages to Brompton-road and Basil-street. Business premises will occupy the ground floor, with entresol and basement, and a glass-covered arcade connecting Basil-street and Brompton-road will contain shops of this description. The whole of the upper part will consist of residential suites, four on each floor. Each flat contains from eight to ten rooms, with large halls, the principal rooms being lighted from either of the thoroughfares mentioned, whilst the other rooms obtain a good light from a large central courtyard. By the means of a transverse corridor the whole is served with one lift and one staircase, thus reducing an item of some importance in the cost of the administration. The treatment of the reception-rooms and halls will consist of enamelled wood panelling, partly filled in with silk, and modelled ceilings, the whole after the manner of the Late 18th-century period. The servants' quarters are cut completely off and self-contained, with ample accommodation, including a bathroom. In the external treatment effect is sought by the retention of undisturbed surface consistent with practical fenestration. The materials employed are stone and red brick, of good colour, and the roofs will be covered with Westmoreland slates. The whole of the building will be rendered as fire-resisting as possible, the materials forming the floors, flats, and roofs being steel and concrete; should fire occur, a thorough system of escape connects with all rooms. At the west end of the block is situated the Sloane-street Station of the Great Northern and Piccadilly Railway, occupying a width of about 45ft., running through to Basil-street, and up to the level of the first floor glazed faience will be freely used externally and internally for this portion, above which flats will ultimately be erected. The contractors for Imperial Court are Messrs. Perry and Co., of Bow, and those for the station portion Messrs. John Allen and Sons, of Kilburn. The total cost of the work when completed will be about £180,000. The whole is being carried out from the designs and under the direction of the architect, Mr. G. D. Martin, F.S.I., of Pall Mall East, S.W.

ROYAL INSURANCE OFFICES, SHREWSBURY.

THIS is a branch office for the Royal Insurance Co., Ltd., now being erected on an important site at the top of Mardol Head, Shrewsbury. The peculiar formation and limited area of the site formed a problem as to how the accommodation required was to be provided. The front is constructed of steel framework with Portland stone frontages, having polished Aberdeen granite lower story. The floors are of steel and concrete, finished with oak block flooring. The accommodation consists of a general office with a mezzanine floor over a portion of same, providing room altogether for twelve clerks, a typist's room, board room, and manager's room; the top floor being devoted to caretaker's residence. Strong room, stationery room, and other accommodation is provided in the basement. A lift for general purposes runs from the basement to top story. The interior will be finished with oak wall panelling and mahogany fittings. The heating is by means of radiators on the low-pressure system. The contractors are Messrs. R. Price and Sons, Shrewsbury. Mr. A. E. Lloyd Oswell, A.R.I.B.A., is the architect.

TOWN SUBWAYS.

(SEE prize essay by R. M. Parkinson, on page 788).

The Board of Trade is about to be asked to grant a provisional order for incorporation of a company to construct a pier and other works at Broadstairs, between Victoria Gardens and the Grand Hotel, upon the roadway known as Louisa Gap, extending seaward for distance of about 1,300ft.

STAINED GLASS.

MOFFAT.—The other afternoon, in the new chapel recently erected in connection with St. Ninians College, Moffat, the unveiling and dedicating took place of a stained-glass window in memory of ten former pupils of the school who fell in the South African Campaign. The window is a three-light one, executed by Mr. C. E. Kemp, London. The central light represents the Crucifixion, in which the victory of Christ over Death is emphasised, while the same idea of victory is carried out in the lesser lights, one of which depicts the victory of St. Michael over the Spiritual Dragon, the other portraying that of St. George of England over the Earthly Dragon. The window is suitably inscribed in Latin.

CHIPS.

A Roman Catholic church is being built in Lyons-crescent, Tonbridge, from plans by Mr. W. R. Hughes, of Tunbridge Wells and Craven-street, W.C.

The Eton College trustees have granted to a syndicate an option of purchase of 243 acres of their land lying to the north-west of Wyldes Farm, for the purpose of establishing a "garden suburb" for the industrial classes.

The tender of Mr. Herbert Holloway, of Wolverhampton, amounting to £11,970, has been accepted for carrying out the sewerage scheme for Penn and Pennfields, near Wolverhampton.

With the object of obtaining further powers as to police and public health, the corporation of Glasgow are promoting a Provisional Order. One of the objects of the order is to authorise the corporation to borrow an additional sum, not exceeding £250,000, to be applied for purposes of the Police Acts, including the cost of new police buildings, fire stations, halls, public baths, and washhouses.

The crematorium which is to be erected by the Bradford Corporation in Scholemoor Cemetery will cost about £5,000. The structure has been designed by Mr. F. E. P. Edwards, A.R.I.B.A., with a free treatment of English Gothic, to harmonise with the other buildings in the cemetery. It consists of a mortuary chapel, 30ft. by 24ft., with a separate chamber containing the furnace. The hall will have a hammer-beam open-timbered roof, and will be approached through an arcaded porch. In the centre of the wall opposite the principal entrance is the catafalque.

A new scheme is under consideration by the town council of Blackpool in connection with the widening of the promenade between the North and Central Piers. It is estimated that the work will cost £144,000. It is proposed that from a point opposite the Tower to the north pier the promenade shall be in two terraces similar to the promenades at North Shore. The upper terrace will be 51ft. wide, and the lower one, which will run further westward, 30ft.

The work of restoring the well-known Guild Chapel at Stratford-on-Avon is now being proceeded with, under the supervision of Mr. J. A. Cossins, of Birmingham. Mrs. Flower, of Avonbank, has given a generous sum to defray the cost.

The new American church in Berlin was dedicated on Thursday in last week. The church, which has been built at a cost of £20,000, will accommodate about 400 people.

A joint committee of the Liverpool Estate and Housing Committees has been appointed to consider a scheme for fulfilling the housing obligations of the corporation under the various Improvement Acts and Orders.

A Volunteer Artillery drill-hall is about to be built in the Main-road, Dovercourt, at an estimated cost of £3,000. The chief apartments will measure 73ft. by 56ft., and adjoining will be a canteen 31ft. by 27ft., a billiard-room, armoury, offices, and stores.

The bell-founders are now busily at work upon the restoration of the bells of St. Mary Magdalen's Church, Pulham Market. Messrs. Warner's, Crippllegate, London, are carrying out the work, which consists of the addition of two new trebles to the present peal of six, the tuning of the old bells, and the construction of a new steel frame in place of the old wood frame.

The Bishop of Durham has dedicated two stained-glass windows in Christ Church, Hamsterley, Durham, to the memory of the late Viscount Gort, the east window having been erected by Viscountess Gort, and the west window by public subscription. Mr. G. J. Biguley, of Newcastle on Tyne, is the artist. The east window represents Our Lord's Ascension, and the west window St. John the Evangelist and St. John the Baptist.

Birmingham Corporation have under consideration a scheme for deepening and lining with brickwork a portion of the bed of the River Lea at Saltley, to prevent floods, at a cost of £30,000.

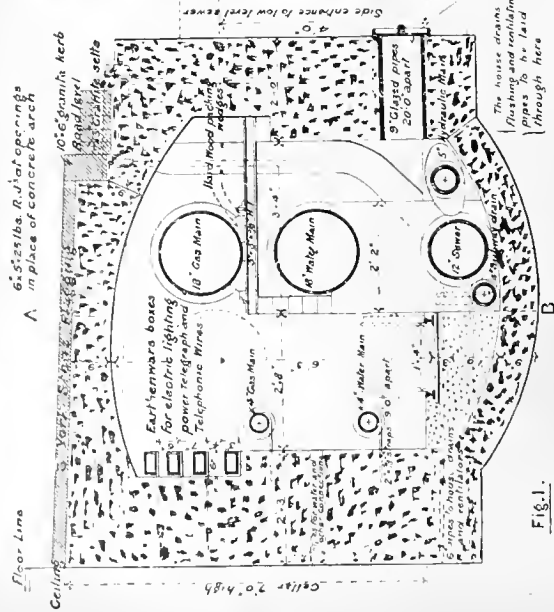


Fig. 1.

DEEP SUBWAY UNDER PAVEMENT

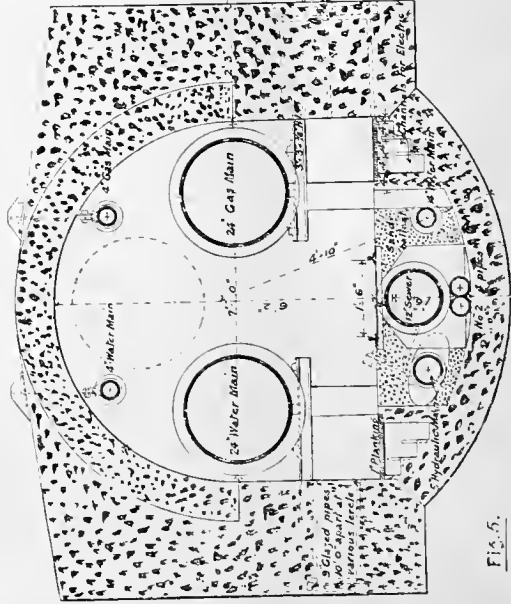


Fig. 5.

SPAL. OFF SUBWAY IN ROADWAY

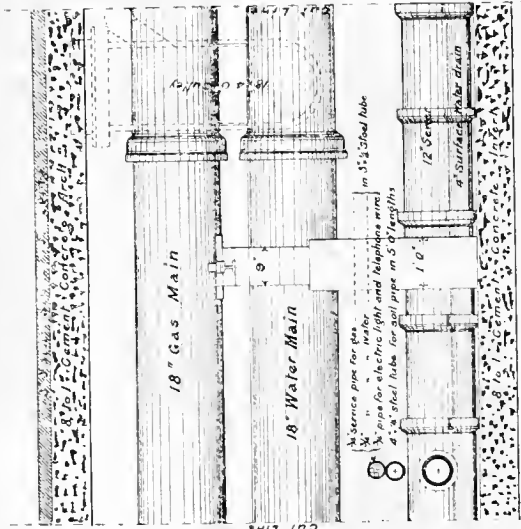


Fig. 2.

SECTION ON LINE A. B. FIG. 1.

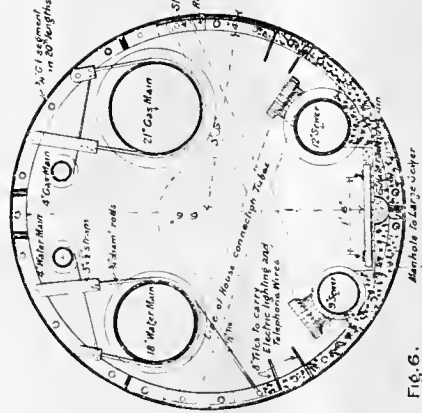


Fig. 6.

DEEP SUBWAY IN ROADWAY

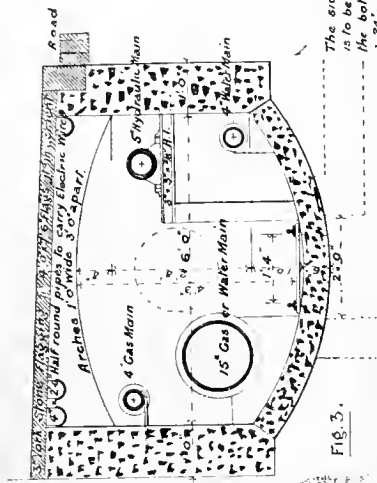


Fig. 3.

SHALLOW SUBWAY UNDER PAVEMENT

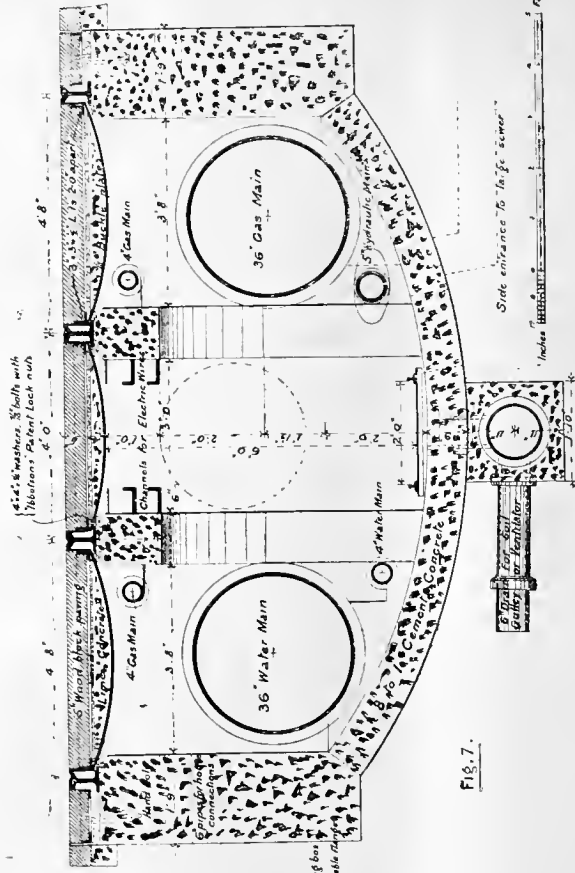


Fig. 7.

SUBWAY'S UNDER TRAILWAY

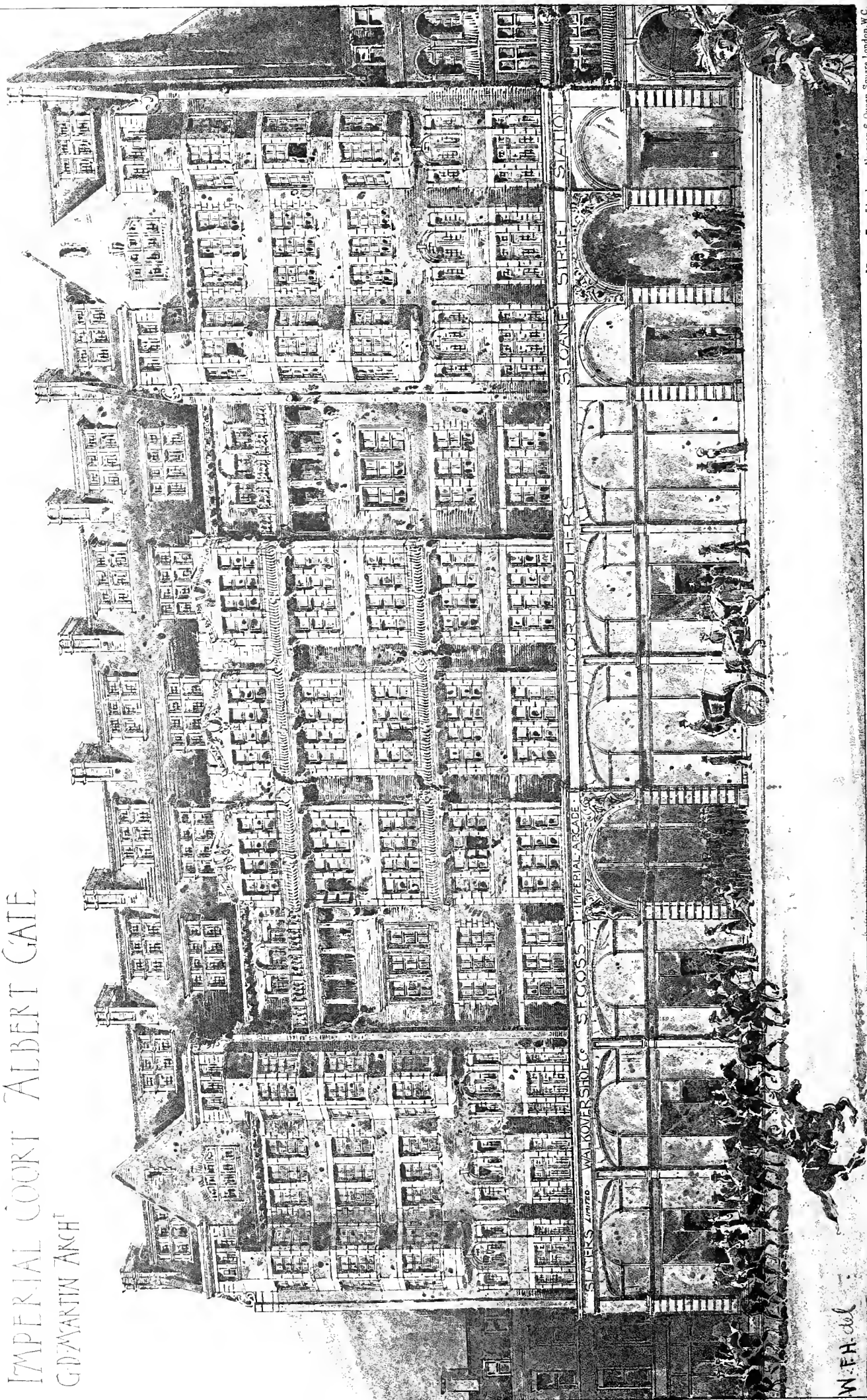
TOWN SUBWAYS.—ILLUSTRATING PRIZE ESSAY ON THE PREVENTION OF THE BREAKING UP OF THE STREETS.

By MR. R. M. PARKINSON.—(See Page 788.)

THE BUILDING BEGINS, DEC. 11, 1903.

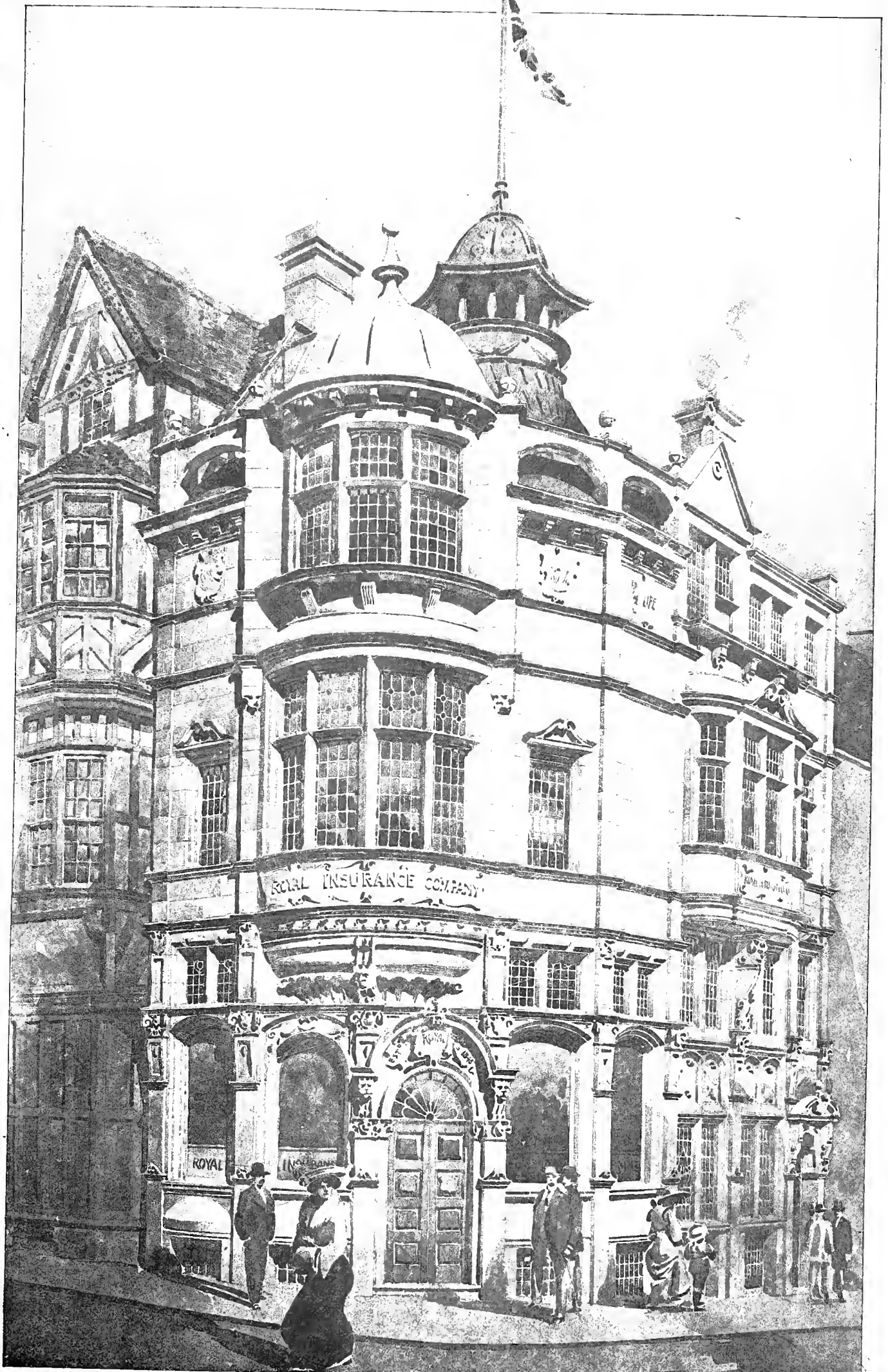
IMPERIAL COURT ALBERT GATE

G.D. VANTIN ARCHT



W.E.H. del

PHOTO-TINT by James Mann & Co. Queen Square London, W.C.



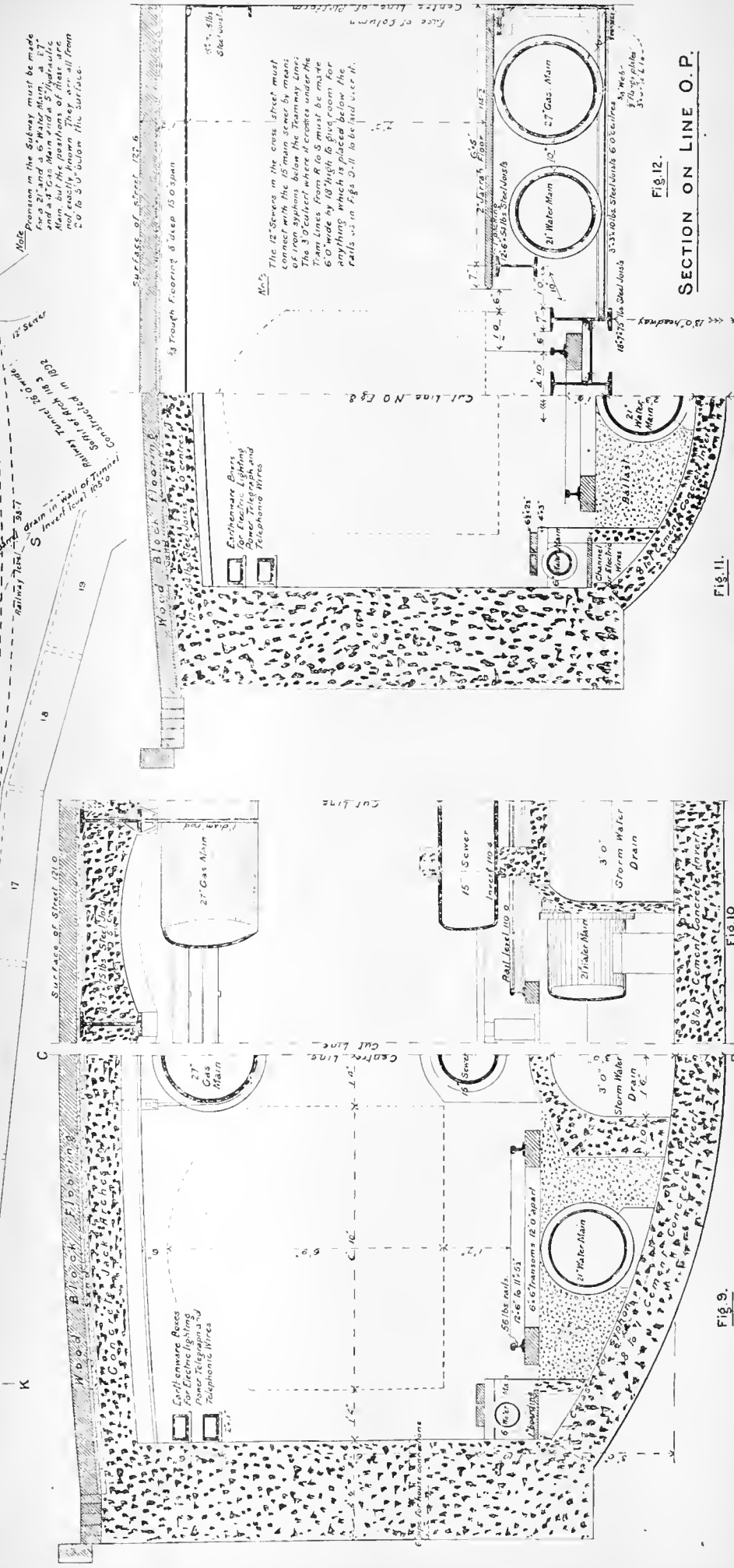
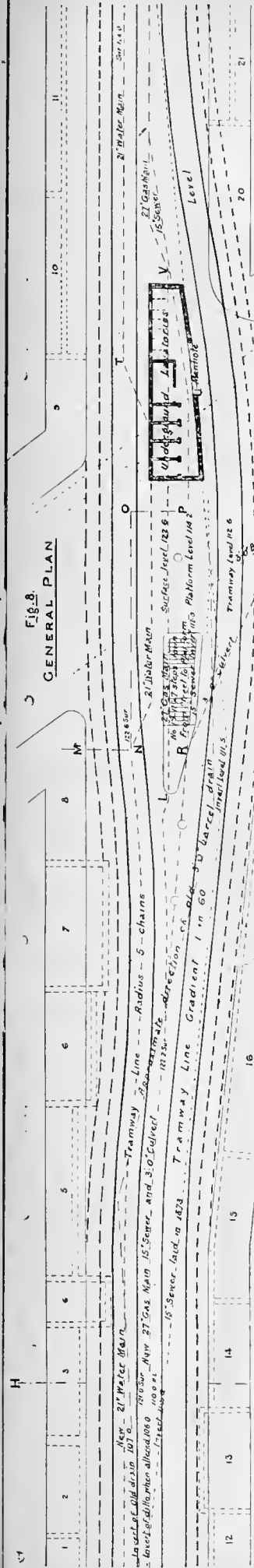


Fig. 9. HALF SECTION ON LINE H.K.

Fig. 10. SECTION ON LINE C.D. No. 2.

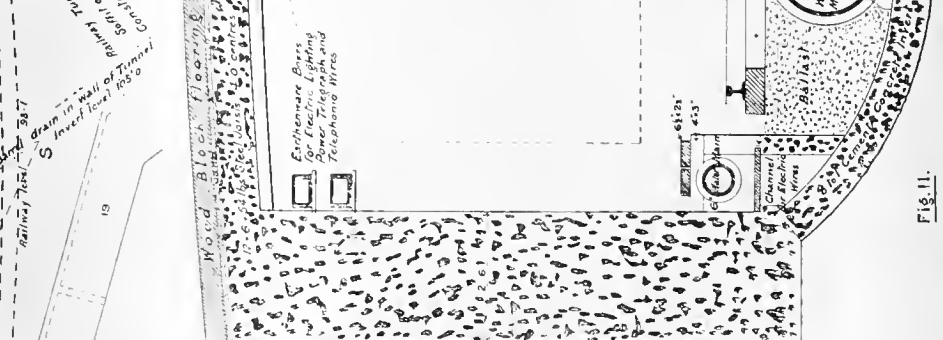
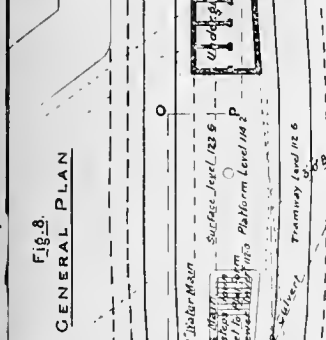


Fig. 11. SECTION ON LINE M.N.

Fig. 12. SECTION ON LINE O.P.

Scale for Fig. 9 1/2 inches = 10 feet
Scale for Fig. 10 1/2 inches = 10 feet
Scale for Fig. 11 1/2 inches = 10 feet
Scale for Fig. 12 1/2 inches = 10 feet

OBITUARY.

The death of Mr. WILLIAM FREDERICK HEMSOLL, architect, took place at his residence, 40, Southbourne-road, Sheffield, on Saturday. He had been an invalid for several years, and unable to attend business since March last. Mr. Hemsoll was a Sheffield man, son of the late Mr. George Hemsoll. He was apprenticed to the profession of architect, surveyor, and valuer, and started on his own account in Figtreet-lane when quite a young man. He was for ten years in partnership with Mr. Joseph Smith, and with him designed and superintended the erection of the Reform Club, several chapels, and other buildings, and afterwards was associated with Mr. H. L. Paterson in the erection of the Woodfinn Convalescent Home and several council schools. His partnership with Mr. Paterson was dissolved twelve months ago, when Mr. F. W. Chapman joined him. He was a Congregationalist, and connected with Mount Zion Church nearly all his life. For twenty-seven years he held the office of deacon and secretary. His death will be regretted by his fellow-members of the Sheffield Society of Architects and Surveyors, and by many other friends. He was fifty-seven years of age, and leaves a widow and three daughters.

Mr. CHARES FOWLER, architect, late of the Portland Estate Office, London, and of 5, Marlborough-place, St. John's Wood, died on Tuesday last at Abbotsleigh, Farnborough, Hants, aged eighty years. He joined the Royal Institute of British Architects as an Associate in 1851, and became a Life Member and Fellow in 1862. He retired to Farnborough about a year ago.

Four stained-glass windows in the sanctuary of St. Mary's Roman Catholic Church, Coventry, in memory of the late Mr. Edward Petre, of Whitley Abbey, were unveiled last week. The windows are the work of Mr. Frank Holt, of Messrs. Holt and Co., stained-glass artists, Warwick. They represent: (1) The Visitation, (2) the Nativity of Our Lord, (3) the Presentation of Our Lord in the Temple, and (4) the Finding of Our Lord in the Temple.

A new organ, built by Messrs. Brindley and Foster, was opened in the Wesleyan Chapel, Thornhill, Leeds, on Saturday.

The Mid-Cheshire Joint Isolation Hospital authority—the first to be constituted in Cheshire—adopted on Friday plans for submission to the county council and the Local Government Board of a joint hospital for the Northwich, Winsford, and Middlewich urban districts and the Northwich rural district. The estimated cost, including site, but exclusive of furnishing and outfall works, is £13,537.

On Friday a memorial window, which has been placed in the east end of Burton parish church, Salop, by the widow of Mr. William Congreve, formerly of Burton Hall, was dedicated by Archdeacon Barber. The centre of the window is the Crucifixion, and on the right and left are St. George and St. Nicholas, the latter being the patron saint of the church.

At Cambridge University on Saturday, the degree of Doctor in Letters was conferred on M. Théophile Homolle, member of the Institute of France and Director of the French School at Athens, who lectured three weeks since at the Royal Institute of British Architects on his recent discoveries at the Temple of Cnidus in Delphi.

At a meeting of the West Hartlepool Town Council held on the 4th inst., Mr. Nelson F. Dennis, engineer and surveyor to the urban district council of Aldershot, was appointed borough engineer and surveyor in succession to Mr. J. W. Brown, M.Inst.C.E., who resigned some two months ago, and will retire from the office at the end of the year. Mr. Brown, who has been nearly 20 years borough engineer of West Hartlepool, has decided to take up private practice as a general consulting civil engineer, and has taken offices in Church-square, West Hartlepool.

The historic Pyx Chapel, adjoining the Chapter House of Westminster Abbey, is about to be lighted by electricity and thrown open for the inspection of the public. The chapel, now under the control of the Office of Works, was at one time the depository of the Regalia of the Scottish Kings. It was here that the famous robbery of £100,000, collected for the Scotch wars by Edward I., took place. Since then access to the apartment, with its double doors of oak, was only possible by the aid of seven keys, which were in the possession of as many distinct officials of the Exchequer. Among the other contents of the chapel are a stone altar, and some ancient chests in which State documents, Exchequer tallies, and standards were formerly stored.

PROFESSIONAL AND TRADE SOCIETIES.

LAIRDS' LOFTS IN SCOTTISH CHURCHES.—Under the auspices of the Edinburgh district of the Ecclesiological Society of Scotland a lecture was delivered by Professor Cooper, of Glasgow, in the hall of the Edinburgh Architectural Association, 117, George-street, Edinburgh, last week. Sir James Balfour Paul, Lyon King of Arms, presided. Professor Cooper took for his subject "Lairds' Lofts in Parish Churches," and illustrated it principally from the churches of the middle Borders. Professor Cooper said that their nobility and gentry (though they themselves in many cases seemed to have forgotten it) were mainly responsible for that form of church government which the Glasgow Assembly of 1638 made the symbol of the nation's liberty, and for the type of parish kirk which was well-nigh universal throughout the country from the days of Andrew Melville to the days of Dr. Chalmers. The Act of Revocation was the real source of the Great Rebellion. But while they gave the least they could for the glory of God, they were by no means prepared to forego either in the kirk or out of it, the honour which they considered to be due to their own temporal place and dignity. The lairds' lofts were a striking instance of this. These lofts had their historical value as witnesses of the relations which, throughout the greater part of two eventful centuries, subsisted between the lairds and the church. They had also in many cases no small artistic merit, and in the severe exclusion of other ornaments they were often the only decoration of the churches where they were found. Many of these lofts were erected at the east end of the church in the chancel, immediately over the place where in pre-Reformation times the altar stood. The reason of this was that in the general spoliation of church property the rectorial tithes passed into the hands of the proprietor, and with them went naturally the chancels of the churches, which it had always been the duty of the rector to maintain.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Edwin C. Wallis, A.I.E.E., Vice-President of the National Association of Electrical Contractors, read a paper on Friday night before the members of the Leeds and Yorkshire Architectural Society. His subject was "Electrical Work as Affecting Architects." He called attention to the numerous electrical appliances which now constitute an inherent part of modern buildings, and urged the importance of the work being thoroughly executed. Lightning-conductors, he said, ought not to be neglected, for if badly earthed or discontinuous they became fraught with danger. No need existed for the hideous obstructiveness at the tops of some conductors, but there was reason for blending them with the metal finial. Electrical hoists were coming more and more into use; they were marked either with continuous current, single-phase current, or two-phase current, and were quite manageable. In some respects they were superior to hydraulic hoists. The cost of working was less wherever electricity could be obtained at a low figure. Speaking of electrical development, Mr. Wallis recalled the fact that twenty years ago there was very little electric lighting in Leeds. The corporation power station in Whitehall-road began with 500 H.P.; but now there was an installation of 14,000 H.P., and another 4,000 H.P. was on order. Great advance had been made in electrical work and accessories, and the improvement was still going on. The tendency was to use higher pressures; where formerly 50 volts were used in lighting, 230 volts were now used. A paper dealing with metal casements was afterwards read by Mr. G. Farrar. Mr. Butler Wilson, president of the society, was in the chair.

LIVERPOOL ARCHITECTURAL SOCIETY.—At the meeting of this society, held on Monday evening, in the Law Libraries, Cook-street, under the chairmanship of Mr. John Woolfall, F.R.I.B.A., Miss Ethel Charles, A.R.I.B.A., London, read an interesting paper, entitled "Reflections on Architecture," to a numerous and appreciative auditory consisting of members and their lady friends. The president, in introducing Miss Charles, described it as a unique privilege to introduce the first fully-qualified lady architect to his confrères. A moment's reflection would show them that those professions to which ladies had already been admitted had not lost any prestige thereby. As examples he mentioned painting, music, medicine, literature, &c. As to

the possibilities of architecture as a paying profession for ladies time alone would show; but he believed they would be useful members of the profession, more especially in domestic architecture and in the planning of houses, where many labour-saving methods were desirable. Miss Charles, in the course of her paper, dealt principally with London modern architecture, with the object of showing that its quality was as true and noble as that of the old days. She was cordially thanked on the proposition of Councillor W. E. Willink, seconded by Mr. T. E. Eccles.

CHIPS.

The interment took place at Bridlington, on Friday, of Alderman John Rennard, C.C., builder and contractor, Bridlington. The alderman and councillors attended, as well as the representatives of various local bodies, including the brethren of the Londesborough Lodge of Freemasons, of which Mr. Rennard was a P.M.

At the meeting on Friday of Stoke-on-Trent Board of Guardians, the Workhouse Visiting Committee reported that they had visited the men's infirmary and were impressed by the fact that the whole of the painting of the workhouse was done by the inmates, thereby saving about £300 annually to the ratepayers. The Rev. R. D. Cheetham said the master obtained estimates for the painting and redecoration of the workhouse some time ago, and they amounted to £150. The inmates, however, had done the work, and as the materials cost £150, the saving effected was £300.

A new organ, which has been erected by Messrs. Abbott and Smith, of Leeds, in the Salem Church of the Methodist New Connexion, Falconer-street, Newcastle, was inaugurated on Friday. It is a two-manual organ, prepared for three.

Mr. A. W. Pelling, who has just retired from the position of manager of the works department, Guy's Hospital, S.E., has been presented by the staff with a roller-top desk and office chair. Mr. Pelling is commencing business as a surveyor at Hither Green, S.E.

Mr. James L. McDougal, Dalkeith, has been appointed burgh surveyor and sanitary inspector for that burgh.

A fire broke out on Sunday at Hermes Lodge, a 14th-century building of three stories, on Mrs. Biddulph Martin's estate, Norton Park, near Tewkesbury. The outbreak occurred in the oak room, on the first floor. The place was destroyed, only a few articles of furniture being saved. The house had recently been restored and enlarged by Mrs. Biddulph Martin at great expense.

Speaking at a meeting in Prince's Park, Liverpool, on Tuesday night, in connection with the special effort now being made to raise an additional £20,000 for Liverpool Cathedral before the King lays the foundation-stone next spring, Archdeacon Madden justified the choice of St. James's Mount on historic, ecclesiastical, and practical grounds. The cathedral would be the first built in the northern province for 700 years; it would be larger than York Minster, and loftier from floor to ceiling than Westminster Abbey; and its twin towers would be 260 ft. high.

The old bridge over the back stream on the road between Longparish and Barton Stacey, a rough timber structure with a roadway of only 13 ft., lately became decayed and dangerous. The Andover Rural District Council decided to build a new one from plans prepared by their surveyor, Mr. John Wormald. The contract was put into the hands of Messrs. F. Beale and Sons, of Andover, and the steelwork was supplied by Messrs. Bowman and Rogers, of Oxhall Steelworks, and has now been completed. The steel girder and concrete bridge has a span of 18 ft. 6 in., giving a clear roadway of 17 ft. 6 in., with a concrete parapet and a rail fence.

On Thursday in last week foundation-stones were laid of a new Constitutional Club at Melton Mowbray. The club will consist of a two-story building of red bricks and stone dressings, facing Sherrard-street, and replaces three dilapidated cottages and a carpenter's workshop. On the first floor there will be a reading-room and billiard-room, with a spare room adjoining. The two last-mentioned rooms can be thrown into one when required, giving a total area for the combined rooms of 52 ft. by 21 ft. Mr. C. M. Barnes, builder, Melton Mowbray, has secured the contract at £1,749.

The burning question at Colwyn Bay just now is once more the purchase for the town of the Pwllcrochan Woods on certain easy conditions. The estate company are willing to sell them for £7,500, which, deducting the cost of a new road the company are making through the woods, is tantamount to £5,500, as the road will cost about £2,000. The woods are the principal attraction of the town, and the general purposes committee have decided, by a majority of seven to five, to proceed with the purchase.

Engineering Notes.

WEYMOUTH.—The Great Western Railway are about to proceed immediately with the important harbour scheme at Weymouth, for which powers were granted in 1898, and which it is estimated will cost about £200,000. For a long time the company have been seriously hampered, owing to the inconvenience of the present narrow harbour. To improve the old harbour was found to be impossible, and the company now propose to make a new harbour on the Portland side of the Nothe, inclosing about 70 acres of water space between the Admiralty Breakwater and the Nothe Fort. To effect this, two new breakwaters will have to be constructed. This will give a harbour which may be entered at any tide. New jetties and warehouses are to be constructed, and a line is to be run along the Admiralty Breakwater for coaling purposes.

CHIPS.

The Richmond Town Council on Tuesday night consented to the London United Tramways crossing Kew Bridge on a bond of £10,000 to complete the reconstruction portion of the Kew to Richmond line in twelve months.

At Monday's meeting of the town council of Glasgow attention was drawn to the saving the corporation had effected by themselves constructing the sewer in connection with the Clydebank works. They had constructed the sewer at a cost of £78,000, which was a saving of £12,000 on the lowest estimate by contractors.

The present parish church of Longstock, near Andover, built in place of an ancient one from the designs of the late Mr. William White, F.S.A., of Wimpole-street, W., and dedicated upon May 13, 1880, has received from time to time many additions, especially since the advent of the present vicar (the Rev. R. S. Routh) to the living some six years later. A fresh feature has just been added, and was unveiled on Sunday. It consists of a triple-panelled tablet, carved in Hampshire-grown oak, upon which occur a list of the various vicars of Longstock (29 in all), extending from the early years of the 14th century until the present time. The work has been carried out by Messrs. Harry Hems and Sons, of Exeter.

Memorial stones in connection with a new Wesleyan chapel at Millbridge, Liversedge, were laid on Saturday afternoon. The new building will cost about £3,000.

Mr. John Boobyer, of Bidford, Warwick, who died on October 11 last, aged 79 years, youngest son of the late Mr. James Boobyer, of Stanhope-street, Strand, London (of the firm of Messrs. Joseph Hurst Boobyer and Sons, wholesale ironmongers) left an estate valued at £3,887 gross, with net personalty £14.

The British Electric Traction Co. will shortly begin the construction of the electric tramway from Durham to Brandon.

At Nevin, South Carmarvonshire, the parish church is being rebuilt at a cost of £4,000 on a new site presented by the Hon. F. G. Wynn, who is also the largest subscriber towards the outlay.

The sub-committee appointed by the Birmingham Board of Guardians to consider the question of improvement in the heating and lighting of the workhouse infirmary has issued its report, which recommends the expenditure of about £3,950 in putting in new boilers and heating apparatus, and £5,750 for the provision of electric light for the building. This means an aggregate expenditure of £9,700.

The plans committee of Aberdeen Town Council sanctioned at their last meeting 23 sets of plans, which will involve a total estimated outlay of £12,000.

The Methodist New Connexion Allen Memorial Schools, in Park-road, Wallsend, were formally opened last week. The scheme includes a church and schools, the latter being now complete. The estimated cost is about £6,650.

The funeral of Mr. James William L. Hawkins, divisional road surveyor for Cirencester (late surveyor for Keynsham), took place at Brockley churchyard, on Wednesday week. The deceased, who was only 28 years of age, was the eldest son of Mr. James Hawkins, of Brockley, Somerset, road surveyor to the Long Ashton Rural District Council.

On Tuesday, Dec. 1, the Bishop of Worcester consecrated the new church of Holy Trinity at Upper Ettington, Warwickshire. The church is built after designs by Mr. C. Ford Whitcombe, of Newman-street, and consists of chancel, nave with transept, vestries, and south porch; while a lofty tower is to be added as soon as funds allow. The materials used are Broadway stone and oak.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

CHRISTMAS WEEK.

Owing to the interruption of business caused by the Christmas Holidays, the BUILDING NEWS for Dec. 25 will have to be published on WEDNESDAY MORNING, Dec. 23.

All advertisements for that issue, therefore, must reach us before 3 p.m. on TUESDAY, Dec. 22.

Correspondents and others will oblige by sending in Lists of Tenders, &c., at latest by the first post on Tuesday morning, Dec. 22.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLVII., XLVIII., XLIX., L., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXXVI., LXXVII., LXXVIII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 6d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 6d. (or 33fr. 30c.). To India, £1 6s. 6d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 6d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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* Replies to advertisements can be received at the office, Clement's House, Clement's Inn-passage, Strand, W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—W. T. C.—P. C. H.—H. W. P.—H. D. B.—N. and M.—V. M. and Co.—F. S.—O. P.

Correspondence.

ASSESSORS AND THEIR AWARDS.

To the Editor of the BUILDING NEWS.

SIR,—The question raised at the R.I.B.A. meeting on this subject cannot be said to be new, and there is almost a nauseating familiarity about the perennial persistency with which it turns up, with all the injustice and hardship entailed upon the profession, who, in these days of competitions, cannot avoid taking part in them. The panacea for all substantial causes of complaint was thought to be found by the establishment of a recognised condition for the appointment of

assessors; but the repeated failures which continually occur, instead of improving matters, tend to aggravate the evil, because committees now naturally enough shield themselves behind the awards of their assessors, who sometimes saddle the promoters of competitions with designs which they themselves realise are unsatisfactory for the purposes intended. So exact is this statement that instances in point are fresh in the minds of all who take an interest in such affairs. I may mention one which happened quite lately in one of the foremost cities in this country. A large establishment for public baths and offices was competed for, and an architect who had had no experience whatever in this class of buildings was appointed from headquarters in London to act as assessor. The premiums were awarded in accordance with his selection, but none of the designs were thought suitable, and subsequently a second competition was held, no assessor being employed, and the building is now in course of execution. A concrete example of failure on the part of an assessor by ignoring specific conditions has recently occurred in another big town, he being, as in the last case, an eminent architect and nominated by the Institute. A series of courts comprised an important feature in a considerable pile of buildings for which there was a competition. The instructions to architects provided that the cells should hold a specified position with respect to the Law Courts. The author of the second premiated design ignored this stipulation; but he took the precaution to obtain the provisional consent of the Government authority in London for the particular arrangement embodied in his scheme, and the assessor seemingly considered that sufficient justification for departing from the rule laid down by the City Council for this particular competition. Now clearly the assessor had nothing to do with any such outside consent or approval, and he ought to have adhered to the conditions set for the determining of the problem in which this special requirement was a leading factor, to secure which many of the unsuccessful competitors had laboured very hard. A contemporary example of the failure of another distinguished member of the Institute Council occurred in the matter of a public library for which a competition was held, he being appointed, as before, as assessor, by the Institute, although a building of this kind does not figure in a list of his own buildings. Over 80 designs were submitted, and the premiums were paid on his award, by which the first place was accorded to an exceedingly commonplace design, while the second was not only that, but also a very poor plan indeed as a library. The town council retained some of the non-premiated designs out of the eighty, and after declining to build either of the assessor's choice, selected one without his valuable assistance. One more specimen of the kind of the thing complained of, and I have done this letter. A church was to be built at a cost of not more than £16,000, and it was set down in the conditions that if either of the competitors estimated his design at more than this sum he would be *hors de combat*, and if the assessor, a well-known R.A., estimated any of the plans at more than ten per cent. above the competitors' estimates, such designs to be excluded. The author of the chosen scheme sent in a plan estimated at his own price of £18,000 without the tower and spire, which he included in his drawings. The result was the church cost £40,000 before it was completed. If such results satisfy the leaders of our profession, or the Council of the Institute, they do not satisfy the bulk of members.—I am, &c.,

O. K.

LIVERPOOL CATHEDRAL.

SIR,—On independent evidence, I may tell you that, undoubtedly, a very keen feeling exists in Liverpool, Manchester, and the North on this subject, and if it is a fact, as is frequently stated, that likely architects, with strong interests and marked ability, were weeded out of the competition to give place to former assistants and pupils, it is not to be wondered at. One thing is very certain, that both Mr. Bodley and Mr. N. Shaw have lost caste, particularly the former, and universally what has happened is considered a lowering of the profession in the eyes of the public. The opinion thus existing is to be regretted, and Mr. Shaw's association with Mr. Doyle in carrying out the Royal Insurance big buildings at Liverpool, the latter being the successful competitor chosen by the former as assessor; likewise his subsequent relationship in the matter of

the Strand Improvement Scheme, the Gaiety Theatre, to wit, tends to strengthen the conviction among many that the protest brought before the Institute last week was justified, and that it represents the feeling of many who do not belong to that body, and many who are not themselves members of our profession.—I am, &c.,
NON-COMPETITOR.

THE "EIGHTY" AT THE INSTITUTE.

SIR,—When the Liverpool Cathedral debate took place at Conduit-street there were, according to the official minutes, eighty members present. Thirty-six voted for Mr. Leonard Stokes's amendment, and fourteen against it; so that thirty members took no part in the voting, because we considered the amendment an adroit *petitio principii*, unworthy of the Institute, and only a trifle less objectionable than Mr. Woodward's first resolution. It would have been more straightforward to have met a direct issue in a straightforward way. Surely the Council might have done that without fear or favour. As it is, courage was wanting, and impartiality is left wandering at large outside.—I am, &c.,
ONE WHO DID NOT VOTE.

BRIGHTON HOSPITAL FOR WOMEN COMPETITION.

SIR,—I quite agree with your last week's correspondent that the proceedings in this matter have been most unusual, and so far as my experience goes without any precedent.

But what did happen is this: All designs were to be delivered not later than Monday, Nov. 9. Immediately after invitations were issued, saying the matron would be "at home" at Mellison's West-street Hall on Thursday, Nov. 12, from 3 to 6, when the designs for the proposed new hospital would be on view, &c.

On the morning of Thursday the competitors received a postcard stating that, "Owing to the fact that several protests had been received against the competitors being allowed to be present at the 'At Home' to-morrow, it has been decided to notify them that no competitors will be admitted to the function."

But this did not prevent any friends of competitors being present, and one hears that at the said function some few of the designs were sought to receive special favour from persons present—viz., Nos. 44, 46, and 25.

Now is it not singular that these numbers received the premiums? The designs, however, do not appear to have been kept so private as they should have been, for I am informed they were seen by others, and what one man could do, another man could have done. Eventually about twelve sets appear to have been selected for final adjudication, and the award was made known in Brighton on the 24th ult., somewhat rather quick work for 62 sets, with reports and estimates, to have been examined, considering what had taken place.

Although we have had the opportunity of inspecting the selected designs, yet I do most emphatically say the same privilege which was extended to the public should have been given to us; and, further, no view should have taken place until after the award.

The question one is inclined to ask is, Are open competitions desirable or healthful to the profession? for in this case here are 58 sets of designs, which probably represent a dead loss of at least £900, literally gone and irrecoverable.—I am, &c.,
ANOTHER COMPETITOR.

SIR,—The justification for the strong expressions of opinion at the Institute last Monday evening, that assessors do not pay sufficient attention to the "conditions" in making their awards, is again brought prominently before the competitors in the above competition.

The condition I refer to is worded as follows:—"Northern windows should therefore be avoided as far as practicable except in corridors, operating theatre, and possibly some upper bedrooms. Yet in the face of this condition the assessor, who all his life has been struggling to obtain as much *sun* as possible into the wards, &c., of his own asylums, places first a design with the *long sides* of the two wards *facing north*, and more than half the side of the maternity ward obstructed on the south side by an escape stairs and sanitary tower. Perhaps, however, the assessor was led astray by the strong resemblance of the elevations to the style of a well-known hospital architect.

I was not a competitor in the competition, fail-

ing to complete my own design owing to other work. I am therefore well acquainted with all the conditions, and, moreover, have seen all the designs sent in, and also the four premiated ones a second time.

The statement in to-day's *Builder* that design No. 46 placed second ought to have been barred from consideration as not providing the staff accommodation asked for, is absolutely incorrect: it provided additional staff rooms, as from a more careful study of the plans would have been seen.—I am, &c.,
NOT A COMPETITOR.

London, Dec. 4.

SIR,—I beg to inclose herewith a letter *re* the above sent to Mr. Holmes to-day, and trust you will find room to publish same.—I am, &c.,
WM. C. F. GILLAM.

Central Chambers, 3, North-st. Quadrant,
Brighton, Dec. 3.

[*copy.*]
Leonard Holmes, Esq., Hon. Sec., Hospital for Women,
76, West-street, Brighton.
Central Chambers, 3, North-st. Quadrant,
Brighton, 3/12/03.

DEAR SIR,—*Re* Hospital Competition. As a competitor in the above, I beg to most emphatically protest against the assessor's award, on the following grounds:—

The design placed first violates the conditions—viz., (1st) "Northern windows to be avoided," (2nd) "Lead flats and skylights to be avoided." The author of the first premiated design has placed one side of the wards due north, and has, I venture to say, about 1,000 to 1,500 ft. super. in lead flats, and has about 12 or 13 skylights of about 800 to 900 ft. super. (I am now speaking from memory).

Apart from many other serious defects in the plan, I consider the above alone should have placed him out of the competition.

Regarding the design placed second, undoubtedly it is the best in the room; but I have had no opportunity to see the other designs sent in, therefore cannot express an opinion whether it is the best design sent in.

Regarding the two designs bracketed third, I would say that one of the designs should have been placed outside the competition on account of violations of conditions as to northern light, beyond being obviously a most expensive design, and could never pass the local authorities regarding the open-air space.

The remaining selected design has omitted the very elementary rules of hospital planning—viz., "cut off" or disconnected lobbies between lavatories and wards. In this case the lavatories open direct into the wards.—Yours faithfully,
W. C. F. GILLAM.

P.S.—I am forwarding copies of this to the building papers.

ARE F.F.R.I.B.A. ALLOWED TO "TOUT"?

SIR,—The other day I had given to me a copy of a professional publication containing a design for a certain institution, the said publication being forwarded, *with the card of the designer*, to the members of a committee who are now considering the preliminaries of a suggested building of a kindred nature. The said designer is a Fellow of the R.I.B.A.

If members of the Institute are permitted thus to "tout," when many unattached practitioners, to maintain the dignity of the profession, always refrain from stooping to such unfair methods, how can we ever hope to obtain Registration, or any other beneficial movement?—I am, &c.,
O. MORES.

RATHER INQUISITORIAL?

SIR,—A communication has reached me from a well-known and respected firm in London—one long closely identified with the building trades, but who are, personally, strangers to myself—relative to an excellent young craftsman (formerly a valued member of my staff), who has apparently applied to them for employment. The letter contains the following printed form, which I am requested (but, on principle, distinctly object) to fill up:—

How long was he employed by you?
In what capacity?
What wages did he receive?
Was he a* good, middling, or indifferent workman?
Was he steady and regular?
Did he keep time well?
What was the cause of his leaving your employment?
Do you consider him honest and trustworthy?
(Signature)

(* Please strike out the words not indicating the character of the person referred to.)

Surely this is very much a resurrection of the offensive "Document," the proposed general introduction of which formed one of the main alleged grievances on the part of the men, and led to the great strike (or lock-out) in London in (if I recollect rightly) the year 1854?—I am, &c.,
HARRY HEMS.

Hotel Blanquet, Elretat, France, Dec. 6.

Intercommunication.

REPLIES.

[12028.]—**Chalk-Gravel.**—See the geological sheets and sections of all counties at Jernyn-street Museum, London. Kelly's "Surrey Directory" has small sketch section and description of chalk; Croydon to North Downs and Thanet beds resting on chalk at or about Croydon, Addington, Sutton, Ewell, and so on to East Horsley.—REGENT'S PARK.

LEGAL INTELLIGENCE.

NEWCASTLE-ON-TYNE IMPROVEMENT SCHEME.—Colonel Ludlow, F.S.I., of Birmingham, the umpire appointed in the cases of the Corporation of Newcastle-on-Tyne v. Simson and McPherson, Dobson, and others, and Piggs Charity, which were heard on October 16 and 17 last, at Newcastle-on-Tyne, has now promulgated his awards, which are as follows:—White House Buildings, Messrs. Simson and McPherson, £22,715; the Turkish Baths and Warehouses, Eric-street, Mr. Joseph Dobson and others, £13,725; the reversionary interest in the above owners, Piggs Charity, £12,733.

AN ARCHITECT'S DIVORCE SUIT.—In the Divorce Court, on Friday, Mr. Justice Barnes, sitting with a special jury, had before him the undefended divorce suit of Spivey v. Spivey and Dixon. This was the petition of John Charles Spivey, an architect, of Leeds, for the dissolution of his marriage on the ground of the misconduct of his wife with Alfred M. Dixon, a member of a firm of brassfounders of Leeds. The co-respondent was a friend of the family, and evidence was given showing that during the absence of petitioner at his club he was in the habit of visiting her house, and staying alone with the respondent for an hour or so at a time. The jury found that misconduct had taken place, and his lordship granted a decree nisi, and directed that a sum of £500, which had been agreed upon as damages, should be paid into court within a fortnight.

IN RE R. S. BUCKERIDGE.—An application was made to Mr. Registrar Giffard on Wednesday for an order of discharge of Richard Smith Buckeridge, who had carried on business as a builder at 37, High-street, Marylebone. The order of adjudication was dated March 30, 1903, and the trustee now reported that proofs would probably amount to £7,554 6s. 10d., and that the assets, which had already produced a sum of £3,825 6s. 9d., might realise a further amount of £600. The bankrupt attributed his insolvency to pressure by creditors, to loss on contracts owing to increased cost of labour and materials, to law costs and sheriffs' and accountants' charges, to bad debts and depreciation in the value of his stock and plant as estimated for realisation. It was reported that the bankrupt's books of account recorded the bulk of his business transactions, but were incorrect and incomplete in some respects. Mr. Registrar Giffard granted the order of discharge, subject to the bankrupt's consenting to judgment for £100. The bankrupt stated that he would consent to judgment for that amount.

Mr. W. G. Watkins has been elected surveyor to the Welton Rural District Council.

Dr. R. W. Johnson, Local Government Board inspector, held an inquiry at the Normanton Urban District Council offices on Tuesday, relative to the proposal of the West Riding County Council to borrow £16,000 for the erection of a joint isolation hospital at Acton Hall, for the townships of Normanton, Altofts, Castleford, Whitwood, and Featherstone.

The city surveyor of Liverpool, Mr. Thos. Sheldrake, has been authorised by the estate committee of the corporation to erect in Everton cemetery an obelisk with suitable inscriptions as to the removal of remains from St. George's Church, St. James's churchyard, and St. Anne's churchyard.

Messrs. R. Hornsby and Sons, Grantham, have been awarded the Government prize of £1,000 in open competition for a military tractor capable of travelling 40 miles with a gross load of 25 tons without renewing fuel or water.

At Wednesday's meeting of the St. Pancras Borough Council, a communication was read from the clerk to the London County Council, conveying the thanks of the Highways Committee of that authority to the borough council for the action taken in giving consent to the construction of a tramway along Tottenham Court-road, and stating that the Improvements Committee had decided to recommend the C. nity Council to proceed forthwith with the authorised widening of the southern end of Hampstead-road, and the Highways Committee had concurred. By 44 votes to 22 the borough council confirmed its previous resolution, and gave its statutory consent to the construction of a tramway connecting with the tramway in Hampstead-road and passing across Euston-road and along Tottenham Court-road to a point opposite the Horse Shoe Hotel.

WATER SUPPLY AND SANITARY MATTERS.

BIRMINGHAM.—The necessity of improving the course of the River Rea at Salfley to prevent the flooding which has invariably followed a heavy fall of rain in that suburb has been under the consideration of the public works committee of the city council for some time past. Plans have been prepared in respect to the work, and these were discussed by the committee at a meeting held on Friday. The idea is to effect an improvement similar to that which was successfully carried out in the neighbourhood of Gooch-street a few years ago. It is proposed to deepen the stream and build brick walls for a distance of three-quarters of a mile from a point on the city side of the Salfley Viaduct to Wile's Mill. The total cost is estimated at £30,000.

LINLITHGOW SEWERAGE SCHEME.—As a result of measurements made by the Linlithgow sewerage scheme engineers, it has been found that water to the extent of eight per cent. of the capacity of the main sewer is finding its way into the sewers from the surrounding ground. In view of the high level of subsoil water at the present time, the engineers have recommended that no steps be taken for the repair of any defects which may be in the sewers until next summer, when the level of the loch and the subsoil water will be lower than at present.

MANCHESTER SEWAGE WORKS.—At the last meeting of the Manchester Association of Students of the Institution of Civil Engineers. Mr. J. Cartwright, M.I.C.E., presiding, a paper was read by Mr. G. J. Fowler, M.Sc., F.I.C., on "The Manchester Corporation Sewage Works." Mr. Fowler gave a résumé of the various steps which led to construction of the present works at Davyhulme, Carrington, and Flixton, to the designs of Mr. Wilkinson, reference being made to the schemes formulated by the late Mr. Lynde and Mr. Allison, and the present city surveyor, Mr. de Courcy Meade. He also related the many problems and difficulties that had to be met in determining the quantities of domestic sewage and trade effluents, and the complex and varying composition of each, mention being made of the various experiments that had been carried out from time to time by Sir Henry Roscoe and others, the results obtained being given in each case. He then dwelt on the merits of land filtration and treatment on contact beds, on the different kinds of material applicable for contact beds; the average cost of construction; the relative areas of primary and secondary beds; the necessity of tank treatment in one form or another; the working of septic tanks, open and covered; the merits of sprinkler beds and close contact beds, &c. In conclusion, he stated that from the experience gained on the Manchester works he was convinced that the scheme now being carried out—viz., treatment first in open septic tanks, by which the mineral and fibrous material are intercepted, followed by treatment over double-contact beds—would prove successful and solve a hitherto perplexing problem. The paper was followed by a discussion, which was taken part in by Mr. W. B. Worthington, Mr. Wilkinson (the engineer for the works), Mr. Congrieve, Mr. Swarbrick, Mr. Mountain, and Mr. Hinnel, M.M.I.C.E.

NEW WATER SUPPLY FOR NICE.—For some time past there has been a movement among the local authorities of Nice with a view to improving and increasing the water supply of the town and its environs. The town council and the water company now being in accord, the work will shortly be commenced. It is proposed to unite the waters of several sources in the vicinity of Grasse at a height of nearly 3,000ft. These are the waters of Gravière, the Bousse, and of the Veguay. This region (owing to the chalky composition of the soil) is uninhabited, and there is, therefore, no danger of contamination. These waters will be, in a short time, conducted direct to Nice from the springs whence they rise. The springs of Gravière are near Benngardin; those of the Bousse near Conségué originate from a torrent in the middle of a chalky stretch of ground, while the springs of the Veguay fall in a cascade opposite the village of Aiglon on the right of the Esteron. These waters will be conducted to Nice by a covered canal from their sources to the consumer's tap. The total length of the canal will be about 40 miles, and it will arrive at Nice at a height of 950ft., on the hill of St. Pierre de Ferie, where a reservoir 32,000 square yards is to be built.

The Duchess of Albany will visit Kingston-on-Thames to-day (Friday) to unveil the Surrey county memorial to Queen Victoria, a memorial tablet to Surrey men who fell in the South African war, and a portrait of the chairman of the Surrey County Council, Mr. E. J. Halsey.

The Wallasey Urban District Council again discussed on Friday the question of a site for the new public offices. A motion to rescind the resolution of the last council adopting the North Mead site was defeated by eleven votes to nine.

Our Office Table.

THE trustees of the National Portrait Gallery have received from Mr. G. F. Watts, R.A., as part of his original gift to the nation, a portrait of the late Right Hon. William Edward Hartpole Lecky, O.M., painted in 1878. This portrait will be placed immediately on exhibition in the Galleries. The trustees have also accepted the three following portraits as donations—viz.: Henry Crabb Robinson, the well-known journalist and diarist, painted by Henry Darvall, and presented by Mr. T. Smith Osler. John Pyke Hullah, the musical composer and teacher—a pencil-drawing by Sir William B. Richmond, R.A., K.C.B., presented by his son, Mr. Francis Hullah, and other members of his family. Mary Ann Paton, the eminent English prima donna, married first to Lord William Pitt Lennox, and secondly to Mr. Joseph Wood—an unfinished sketch in oils by Thomas Sully, presented by her representative, Mr. Robert H. Wood, M.A. The trustees have also acquired by purchase an interesting portrait of Henry Purcell, the famous English musical composer, painted by John Closterman.

THE King has invested Mr. James Knowles with the insignia of a Knight Commander of the Royal Victorian Order, and conferred upon him the honour of Knighthood. Sir James Knowles, who is the founder, proprietor, and editor of the *Nineteenth Century*, and is 72 years of age, was originally an architect, and is still a Fellow of the Royal Institute of Architects. Among his works are the late Lord Tennyson's Surrey House, Kensington House, the Thatched House Club, the public garden and fountain in Leicester-square, and a number of churches. In addition to his professional work, Mr. Knowles wrote a good deal from his earliest years, and originated the *Metaphysical Society*. In 1870 he succeeded Dean Alford as editor of the *Contemporary Review*, but seven years later, on a change of proprietorship, he founded the review he has since conducted with such conspicuous success. The introductory sonnet was written by Lord Tennyson, who for many years was his constant companion. Mr. Knowles had been on terms of close friendship with many of the leaders of thought of his time.

THE post of Professor of Painting at the Royal Academy, which has been vacant since the resignation of Mr. Val Prinsep, R.A., last February, has been filled up at a general assembly of Academicians. The choice of the Forty fell on Mr. George Clausen, A.R.A., and on Mr. Clausen will devolve the duty of delivering six lectures on painting in January and February. Mr. Clausen's lectures are likely to be largely attended, for his election is one that will meet with the approval of many who do not ordinarily support the Academy. While a student at South Kensington, Mr. Clausen gained (in design) two gold and two silver medals in the national competitions and a national scholarship. He has also been awarded medals, in Paris in 1889 and 1900, at Chicago in 1893, and in Brussels in 1897. At the age of twenty-four he exhibited a picture in the Royal Academy, "High Mass at a Zuyder Zee Fishing Village," and for some years he painted Dutch subjects. Among his best-known works are "The Girl at the Gate," which was purchased by the Chantrey Trustees; "Labourers at Dinner," "The Ploughboy," "Brown Eyes," "Mowers," "Evening Song," "Turning the Plough," and "The Mother."

UNDER the auspices of the Hampstead Art Society, Mr. Henry Rose gave on Friday night, in the town hall, Haverstock Hill, an illustrated lecture entitled, "From Phidias to Flaxman: the Story of Sculpture." Mr. Rose characterised sculpture as frozen music and poetry, and, after laying down the principles of the art, proceeded to illustrate the work of primitive man, following on with that of Egyptians, Assyrians, and Greeks. This led to the introduction of the labours of Phidias and the beauty of the Elgin marbles; then followed reference to Praxiteles and later Greek work—the Apollo Belvedere, the Dying Gaul, the Laocoon of the Vatican, and Aphrodite of Melos. Early Christian sculpture came under review and illustration. Modern sculpture, with the productions of Canova, Thorwaldsen, Rauch, and Flaxman, followed in review, and the lecture closed with references to the Albert Memorial Chapel, Windsor.

NEGOTIATIONS have been proceeding for some time with a view to the amalgamation of the two

organisations which represent sanitary inspectors in England and Wales—the Sanitary Inspectors' Association and the National Union of Sanitary Inspectors. The Association, which has its headquarters in London, has a membership of about 700, whilst the National Union, which was founded in 1887 as the North-Western Sanitary Inspectors' Association, is about 400 strong. Liverpool may be considered to be the centre of its activities. A quarterly meeting of the executive council of the National Union was held in the Manchester School of Technology on Saturday, when Mr. H. H. Spiers, of West Bromwich, the chairman, reported favourably on the progress of the negotiations. The Association, an incorporated body, has already altered its articles of association so as to meet the views of the members of the Union, and heads of agreement respecting details of administration have also been drawn up by the chairmen of the two organisations. Mr. Spiers reported that the Association had conceded everything which the Union had asked for. The executive approved the heads of agreement. Four delegates were appointed to attend the meeting of the executive of the Association in February, and the hope was unanimously expressed that the arrangements for amalgamation will then be completed. In the event of an agreement it is intended that the Union shall be dissolved, and the members elected *en bloc* as members of the Association.

THE Worshipful Company of Plumbers have issued a note drawing attention to the great improvements in the qualifications of plumbers which has resulted from the system of registration established in 1886. They recommend that all plumbing classes should be placed under the direction of committees on which the local education authority, the master plumbers, and the operative plumbers are represented. A syllabus has been drawn up for the use of plumbing classes, and examinations (preliminary, intermediate, and final) are held at regular intervals in both the theory and practice of plumbing. In connection with this system of technical training a form of indenture of apprenticeship has been drawn up by the Company, and has been accepted in principle by both employers and workmen. This indenture seeks to combine the ancient system of apprenticeship with modern methods of technical education. It provides that the apprentice shall attend evening classes, and at regular intervals present himself for examination.

THE Association of Chambers of Commerce of the United Kingdom have received an important communication from the Postmaster-General, giving useful information regarding the progress of the underground telegraph line to the North. The temporary wires in the pipes between Birmingham and Warrington are being replaced by a permanent cable. Seventy miles of this cable have been drawn in, and when the remaining twelve miles are drawn in there will be a permanent underground system between London and Birmingham, Manchester, and Liverpool. There are already underground wires between Warrington and Manchester and Liverpool. The laying of the pipes north of Warrington to Carlisle is progressing, and the work will be finished this month. Temporary wires have been drawn in as far as Wigan, and will be continued to Preston. A permanent cable to Carlisle will be provided later. In Scotland it has not been possible at present to undertake more than one section of this work. That section is over the Beattock incline, where the overhead wires are much exposed, and the pipework is completed. Pipes are also being laid north-eastward from Manchester to Leeds, and temporary wires will be provided, to be replaced later on by a permanent cable. This work will be completed before the end of the financial year.

LORD JAMES OF HEREFORD has just signed his final award as umpire in the arbitration on the use of lead glaze in the making of pottery. His lordship's final award, dated November 28 last, establishes a new rule 2, under which it is generally provided that after February 1, 1904, no glaze shall be used which yields to a dilute solution of hydrochloric acid more than 5 per cent. of its dry weight of a soluble lead compound calculated as lead monoxide when determined in a manner prescribed by the rule. The use of a glaze "which does not conform to the above-mentioned conditions" is, however, to be permitted after due notice to the inspector for the district, subject to the adoption by the manufacturer of a new schedule of compensation to

employees who may be suspended on being certified as suffering from plumbism (or lead poisoning), and subject also to periodical examination of the employees by the certifying surgeon. China scouring is excluded from the processes dealt with by these regulations. The prescribed method of testing the glaze is as follows:—"A weighed quantity of dried material is to be continuously shaken for one hour at the common temperature, with 1,000 times its weight of an aqueous solution of hydrochloric acid containing 0.25 per cent. of HCl. This solution is thereafter to be allowed to stand for one hour and to be passed through a filter. The lead salt contained in an aliquot portion of the clear filtrate is then to be precipitated as lead sulphide, and weighed as lead sulphate."

The members of the National Association of Master House Painters and Decorators will hold their eleventh annual conference in Manchester next September. To mark its importance and provide funds for the equipment of the new school of decorative painting and the educational work of the association, they intend to hold an exhibition of decorative and applied arts, processes, and manufactures in St. James's Hall in that city. The exhibition will include furniture, carpets, hangings, furnished rooms, wallpapers, relief materials, paints, colours, and varnishes, water paints, tiles, pottery, sanitary appliances, and stained glass. An important section will be devoted to "processes," where various handicrafts will be seen in actual operation.

The Bristol Corporation Baths Committee have provided a suite of baths on Kane's system at the new buildings on Barton Hill. In this new system of baths, the only one of its kind in existence, instead of the bather undressing, bathing, and dressing in the same temperature, a central hall is provided, down the centre of which are placed the bath compartments. On each side of the walls of this central hall are placed the dressing-rooms, each with a door in the wall of the central hall corresponding with the door of a bath compartment. The central hall, in which are placed the bath compartments, is heated to over 100°, while the dressing-rooms are heated to about 65°. The ordinary type of slipper-bath is fitted in a cubicle, which also serves as a dressing-room, with the consequent result that if the compartment is heated to a temperature suitable for a bathroom, it becomes too hot for a dressing-room. On the other hand, if the room is heated as a dressing-room, the bather must, after immersing himself in water heated to 98°, stand in air at 65°. In Kane's system, whatever the temperature of the bath may be, the air of the bathroom is always higher.

SIGNOR PASQUI proposes to re-erect in Rome, at an estimated cost of some £4,000, the famous Ara Pacis, erected to Augustus when by many desperate wars he had pacified the world. It was among the most striking monuments of Ancient Rome, and its recent rediscovery is one of the most important archaeological events of recent years. In 1500, and again in 1859, chance excavations revealed minor portions of it, which were dispersed in various collections. The remainder came to light in the course of last summer during the progress of excavations in the Piazza San Lorenzo in Lucina, near the Corso, under the charge of Signor Pasqui. A mine of architectural and sculptural wealth was discovered in the course of a few months, including the whole of the Ara Pacis, save two fragments resultant on the above-mentioned earlier researches. It is now suggested that it be erected in its entirety, not in the open air, but in some such position as the covered-in court of the baths of Diocletian. Professor Pasqui declares that it would not be difficult to reassemble those previously found portions now dispersed in various collections in Italy and abroad. The greater proportion are in the Uffizi at Florence, belonging to the State. Other fragments are in the Vatican, and should not be difficult to obtain. It might, however, be less easy to secure those now in the Medici Villa, the Paris Louvre, and the Vienna Museum; they are, however, comparatively unimportant, and could be, if necessary, reproduced in facsimile.

UNEXAMPLED activity has characterised the building trade in Canada this year. The lack of men and material is stated to have seriously curtailed the building operations necessary for current requirements. In Winnipeg, a typical centre, upwards of 6,000,000dols. (£1,200,000) has been spent on new buildings alone during the present year, comprising 1,200 dwelling-houses, 65 stores,

and several new churches. Under the influence of this pressure the building season in Canada is extending year by year, and bricklaying now goes on almost up to Christmas. Carpenters and joiners can also be similarly engaged in outside work, to be followed with sufficient inside work to keep most of them going throughout the winter.

A WRITER in *L'Industrie* gives the following as a method which he has proved to be successful for drying out damp walls and humid surfaces: Dissolve 5lb. of pure olein in 5lb. of benzine, and coat the damp surfaces with the mixture. This solution of oleic acid, owing to its great fluidity and the capillarity of the mortar, sinks deeply into the latter, and, together with the hydrated lime in the mortar, produces a formation of greasy lime which constitutes a waterproof coat. The proportions of the mixture can, of course, be modified according to circumstances; and, instead of benzine, other solvents of the nature of ether and benzol may be utilised. A variation of this method is the employment of other fatty or resinous acids instead of olein. The resinous acids form with the lime hydrate a resinate of lime which has the same waterproof properties as fat lime. Damp or newly-built walls thus coated may, after almost instantaneous evaporation of the liquid, be papered or painted. In the case of walls in cellars or tunnels, this process can be also employed successfully to coat cement, terrazzo, or mosaic work.

CHIPS.

The dedication and opening of the new organ at St. Werburgh's Church, Chorlton-cum-Hardy, took place on Friday evening. The organ has cost £725.

An inquiry was held at Milton, near Lymington, Hants, on Thursday in last week, by Mr. Tulloch, an inspector of the Local Government Board, with reference to the proposed borrowing of £5,500 for the purpose of drainage works at Milton.

The general purposes committee of the Poplar Council have approved the proposals of the London County Council to seek powers next session to construct tramways from East India-road, through the Blackwell Tunnel, to Greenwich.

At a meeting of the Blackburn Queen Victoria Memorial Committee on Thursday evening in last week, it was resolved to instruct Mr. Bertram Mackennal, the sculptor, to proceed at once with his marble statue of the late Queen, to be erected on the boulevard near the railway station. The statue, which will show her Majesty in a standing position, is to cost £2,500.

At Avonmouth, Bristol, on Friday, memorial stones were laid of a new Wesleyan school chapel. Messrs. La Trobe and Weston, of Bristol, are the architects, and Mr. E. Love is the builder.

The Bishop of Leicester consecrated, on Sunday, in Sepulchre's Church, Northampton, one of the four round Templar churches of the country, a stained-glass window in memory of the 98 non-commissioned officers and men of the Northamptonshire Regiment who died in South Africa during the war. The window, placed in the south aisle, is of three lights.

On Thursday in last week, Col. Yorke attended at Walsall on behalf of the Board of Trade for the purpose of inspecting the new tramway lines which are to be opened on January 1, when they will pass into the control of the Corporation. Accompanied by members of the council and chief officials, Col. Yorke was taken over the whole system, which extends to Walsall Wood and Willenhall and to the borough boundary in three other directions.

The highways committee reported to the London County Council on Tuesday that it is hoped that it may prove possible to commence the electrical working of the New Crose and Greenwich, &c., sections of tramways by the end of the present year. The reconstruction of the tramways is completed and the electric cables are laid, while the arrangements at the sub-stations and for the provision of the supply of power from the London Electric Supply Corporation's station at Deptford have reached an advanced stage.

A lecture, entitled "Decorations Past and Present," was delivered by Colonel R. J. Bennett, of Glasgow, president of the Association of Master Painters of Scotland, to the Edinburgh and Leith and Vicinity Master Painters' Association in Dowell's Rooms, Edinburgh, on Friday night. Mr. J. R. Muirhead presided over a good attendance.

The new church of St. Mary Magdalene in Pockthorpe, Norwich, was consecrated by the Bishop of Norwich last week. Late Perpendicular in style, it is built of brickwork, with Monk's Park stone dressings. At present only the chancel and four bays of the nave have been erected at a cost of £4,000. Mr. A. J. Lacey, of Norwich, is the architect.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Incorporated Institute of British Decorators "The Management of Decorative Work in Progress," by John D. Crace, President. 8 p.m.

Royal Institute of British Architects. "The Royal Victoria Hospital, Belfast," by William Henman and Henry Lea. 8 p.m.

Society of Arts. "The Mining of Non-Metallic Minerals." Cantor Lecture No. 4, by Bennett H. Brough. 8 p.m.

Surveyors' Institution. Discussion of "Model Building By-laws." 8 p.m.

Incorporated Clerks of Works Association. "Ingram Houses Residential Clubs," by Arthur T. Bolton, A.R.I.B.A. 8.30 p.m.

TUESDAY.—Institution of Civil Engineers. "Deposits in Pipes and other Channels Conveying Potable Water," by Prof. James Campbell Brown, D.Sc.; "The Purification of Water Highly Charged with Vegetable Matter; with Special Reference to the Effect of Aeration," by Osbert Chadwick, C.M.G., M.Inst.C.E., and Bertram Blount, Assoc.Inst.C.E. 8 p.m.

Society of Arts. "The British Silk Industry," by Frank Warner. 8 p.m.

WEDNESDAY.—Society of Arts. "The Science of Taxation and Business," by Sir W. H. Preece, K.C.B. 8 p.m.

Architectural Association: Discussion Section. "The Work of an Exhibition Architect," by A. O. Collard. 7.30 p.m.

Edinburgh Architectural Association. "The Objects of the Garden City Association," by W. E. Soell. 8 p.m.

THURSDAY.—Society of Arts. "India's Place in an Imperial Federation," by J. M. Maclean. 4.30 p.m.

Society of Architects. Discussion on a "Bill to Amend the Law Relating to Ancient Lights." The Society's New Premises, Staple-Inn South, Holborn. 8 p.m.

FRIDAY.—Architectural Association. "Old Stucco and Plaster Work," by G. P. Bankart. 7.30 p.m.

Institution of Civil Engineers. "The Action of the Sea Upon the Fore-shore," by C. B. Case, Stud.Inst.C.E.; and "The Cause of the Loss of Beaches," by F. W. Cable, Stud.Inst.C.E. 8 p.m.

Glasgow Architectural Craftsmen's Society. Debate on "Should Architects be Arbitrators in Disputes on their own Work?" by R. W. Horn and Isaac Low junior. 8 p.m.

THE ARCHITECTURAL ASSOCIATION.

—DECEMBER 15th: ORDINARY GENERAL MEETING at No. 9, Conduit-street, W., at 7.30 p.m. PAPER by Mr. G. P. BANKART on "Old Stucco and Plaster Work, with Reference to Modern Possibilities."

LOUIS AMBLER } Hon. Secs.
H. TANNER, Jun. }

Trade News.

WAGES MOVEMENTS.

THE NORTH WALES SLATE TRADE.—A meeting of quarry-owners in the Nantlle Vale and other districts of Carnarvonshire was held at Carnarvon on Saturday, under the presidency of Mr. John Menzies, for the purpose of revising the price list. It was decided not to make any change. The state of the trade was reported good. It was understood that the owners of the Penrhyn and Dinorwic Quarries have also agreed not to change the price list.

A general meeting of the Freemasons of the West Lancashire province was held on Wednesday at Liverpool, to consider and decide upon the provincial grand master's wish that the brethren should erect some special portion of Liverpool Cathedral. After considerable discussion it was resolved that the money subscribed during the next five years should be devoted to the erection of a chapter-house as a memorial to the late Earl Lathom.

At the Carpenters' Hall, on Wednesday night, Lord George Hamilton, M.P., distributed the prizes and certificates gained during the past session by students at the Trades' Training School, Great Titchfield-street, which is conducted by the Carpenters' Company in conjunction with the Joiners', Paper-Stainers', Plasterers', Tylers' and Bricklayers', and Wheelwrights' Companies. The chair was occupied by Mr. Percy Preston (Master of the Carpenters' Company). Mr. John Willson (chairman of the joint committee) stated that there were twelve classes in the school, eleven of which were closely connected with the building trade. The school differed from all other technical schools by insisting that all students must be connected with the trade as working members before being admitted, thus supplying that instruction which was formerly provided by trade apprenticeship. There had been a decline in the number of students from 260 in 1901-2 to 241 in the past session.

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BUILDING METHODS AND THEIR ORGANISATION.

SUCCESS in most occupations largely depends on efficient organisation, a due relation of one part of the work to the other parts, so that there may be no friction or overlapping. A good deal of the professional architect's work is lacking in this quality. His earlier years are taken up with profitless studies of no practical value to him. His book and class studies bear very indirectly on the practical work he is called upon to undertake; he spends much of his time in drawing and sketching, which are of doubtful value to him, and have little relation to the practice of his vocation. But it does not end here. When he begins to practise he finds the same want of relation, the same obstacles to his action in the requirements of clients, local authorities, and builders. A great deal of his energy and ability is wasted on preliminary duties of not a very remunerative kind; he has to prepare plans and designs to suit various tastes before one is selected. The architect has got the wrong client, or the client the wrong architect, for his particular wants. They do not suit each other. The fact is, as it often happens, the architect does not know his client well enough to design a house for him.

A Philadelphian architect lately gave his experiences, in a paper read at the Ontario Association of Architects at Toronto, on a first interview with his client. The client said first he would like to see the house that the architect would design for him, and then he gave the architect his instructions about the number and size of rooms, &c. The architect replied he could do that, but honestly admitted that, if such a house was built according to bare directions, the result would be disastrous, for he did not know the client well enough. But the client was satisfied, for he began to see and "realise that the house was to be his house, not an architect's house merely." The man who comes to an employer and says, "Give your house to me to design; I can refer you to Squire So-and-So, who was highly satisfied, and do not bother about the design; I will guarantee to suit you at a certain cost, &c.," is not the man to be trusted, for he cannot suit another man's taste or habits of life. The house or building "must fit the man in some way." It is not every architect who has the responsive feeling to find out the kind of house a client needs. A man of common or vulgar tastes will want a very different design to a man of culture. Then there is a lack of organisation in our business methods which our American brethren do not experience. When our architects are instructed to proceed with a building, it is not all smooth sailing. Perhaps the architect has forgotten to conform to a local by-law or regulation, and the plans have to be altered to pass the authority. And this may happen after the contract has been signed. A delay follows, during which time very important preparations could have been made by the contractor; or perhaps the trenches have been dug out, when the order comes to set them all back. Often the time is spent in negotiations which ought to have been settled before the builder was engaged. A certain period for completion of works has been fixed, so that, when the work is resumed, the contractor is at a serious disadvantage. He has been unable to make arrangements with his foreman; materials which could have been ordered and delivered are delayed; he is unable to organise his staff of workmen to

the best advantage;—all of which are serious drawbacks to him. The building will cost him more. But a considerable cause of delay to the contractor is the non-completion of the drawings and details, chiefly the fault of the architect. Inadequately supplied with these and the necessary instructions, the contractor is at a loss to know what his work is, and how to organise it to his advantage. It is a common cause of complaint with the builder. The proprietor wishes the work to be begun at once, so the architect just scrambles through his drawings in pencil for the quantities to be prepared and the tenders sent in. A tender is selected, and the contractor signs the contract; but his work is at this early and important stage delayed by not being supplied with the drawings and details. The builder is thus hurried to commence before his instructions are complete. As we have seen, the American architect is far more thoughtful in his method in this respect; he rapidly completes the drawings and details in order to enable the contractor to organise his work and to know what he has to do—a matter of extreme importance to him if he is to make a fair profit. The architect in the States takes great trouble in making his drawings complete. If it is a steel skeleton building, he employs a specialist in steelwork to assist him in the design and details before going to contract; if there is much machinery or plant to be provided, a mechanical engineer is called in to co-operate with the architect. There is no question of expense, as the proprietor pays gladly for any special aid, mechanical or otherwise, to complete the work at an early date. But the architect in this country seldom incurs any expense in aid of this kind; he appears to think that expedition or hurry is detrimental to the building, and that if the details are supplied during the progress of the work it is sufficient. Yet such a view leaves out of consideration entirely the contractor's interest, which is exactly the reverse. The sooner he has definite instructions and the whole of the drawings, the better able he is to husband his resources to the best advantage, to organise labour, to order the materials in time. And it is the more urgent to him if the time of completing the building be short. It is in such a way as this that English building practice is wanting in that smoothness that characterises building operations in America and other countries; it is one of the main causes of that dislocation between the architect's and the builder's work which is so detrimental to honest and sympathetic design; as, for example, in requiring in the drawings certain things to be done in a certain way, and withholding the very means of complying with them during the progress of the work; in providing a period for the completion of the building, when at the same time the contractor has been prevented from performing the work by not receiving the detail drawings soon enough. Thus the architect, often unknowingly, by the method he adopts, withholds from the contractor the very means by which he can accomplish his work. How often, for instance, the contractor, not receiving a detail in time, executes the work in a different way to that the architect intended; it is not approved, and the loss falls on the contractor. A week or month saved in the preparation of the drawings is so much gained in the quality and finish of the work, besides a pecuniary gain to both employer and builder. In this neglect of supplying the drawings and details at an early date, we have an instance of the want of system and method and connection between the architect's work and the contractors. The interests of the architect should be those of the contractor, the aim ought to be to aid and assist the carrying out of the design; instead of which the practice we have mentioned illustrates in a forcible manner the lack of co-operation between the

architect and contractor. Each seems to be pulling in an opposite direction. In the preparation of the design, the builder is rarely consulted, even if that were possible, and the idea seems to be to conceal from the contractor the design as long as possible in the hope that he will not be able to obtain any advantage by a too early knowledge. Such an idea is too absurd to entertain, because it is more likely that the contractor will do the best with the design, and make the execution more acceptable to the architect, if he has ample time to make the necessary preparations and obtain the best hands for the work. An early delivery of the drawings and details insures, amongst other things, a study of the building, and the best means to meet the architect's wishes; the contractor has time to consider how best and most economically to set to work; there is more scope for any suggested alteration in the design; the contractor is better able to organise his labour. The work must benefit, as the early supply of the drawings means more careful consideration, the ordering of material in time, the selection of better hands to carry it out. In America, where buildings are carried out with great expedition, early delivery of drawings and details is held to be of the utmost importance, and the profession are trained to a sense of the necessity of rapid working. We are not quite of the same opinion in this country; quality, and not speed, are required by us. Rapidity of execution often means hurry; a want of study as to the best means to the end; instability, and resort to mechanical labour. Yet one of the advantages of the speedy furnishing of drawings was to be seen in the erection of steel buildings, as those in the States. Here the steelwork is practically ready before it is required on the building. The drawings are supplied to the contractor, who often has a special staff of engineers, and the steel is rolled and superintended under their supervision; but in this country we know how a quantity of steelwork would be carried out. The architect's design would probably be submitted by the contractor to an expert steel maker, who would give a tender for the work, he being allowed to make certain modifications and practical details; but the drawings would not be ready till after the contract had been signed, which would lead to disagreement between the contracting parties; or if the contractor undertook to provide the steel construction, he would have to wait for the details, and the consequence would be a delay in the execution of the order, or an attempt to substitute a less costly design. In either case there would be considerable delay in execution. In the ordering of terracotta work we know also the importance of expedition. Drawings and details ought to be furnished before the works are commenced, as much time is taken up in the pattern moulding, drying, and firing.

Another of the hitches in modern building methods is caused by the want of co-operation between the architect and the builder or crafts employed. How few architects ever take the trouble to consult the workers in making their details. Take an instance. The building includes a number of stone columns or mullions, and a long run of stone cornices. Before making the working drawings it would be a decided advantage to talk the matter over with the practical mason, who would in most cases be able to suggest to the architect more economical dimensions, or sections that would be easier worked, or a better plan of jointing. In the design of terracotta work, a consultation with the manufacturer would be decidedly desirable before making the large scale drawings, so as to avoid any undesirable profiles, which would cause uneven shrinkage and warping. Before the drawings of iron and steelwork are prepared an expert in such construction should be consulted as to the depth of girders and beams, stanchions

and columns, or trussed roofs, and thus save many alterations that would be costly. Much waste of material and labour could be avoided if the architect had interviews with the carpenter and joiner, for he would be able to suggest simpler and better modes. In the design of such work as lead-glazing, tile-work, ornamental plaster work, the architect would find it to his advantage to consult the artists engaged, and a frequent visit to their workshops and studios ought to be considered a necessary condition of design. The consequence of the present "stand off" policy adopted by the professional man is that the trades do not understand the architect. He speaks in a language not understood by the operative artist, his drawings are often awkward and unsympathetic with the materials and methods used, if not impracticable to work. He shows the detail to the foreman or builder, who recommends a modification, or it is referred to the architect to explain. A delay in the execution of the work occurs, and the intention of the architect is often frustrated. The co-operation of the designer and workman is the only way out of the difficulty. In the earlier ages the designer and craftsmen were one and the same, and the hiatus was avoided. In such work as sculpture, carving, and metalwork there can be no true and honest art under the modern conditions. The misinterpreted details, the starved and pinched stonework and joinery, the eccentric and grotesque ornament, the want of harmony between the general design and the details of fittings, are all evidences of the want of co-operation, of continuity of intention, of the utter discordance between the architect's design and its performance by men who have only a commercial interest in the scheme. The separation or disjunction in our building methods, the want of relation and dependence in the architect's studies, are evils which we are only slowly beginning to realise. A comparison with the methods adopted in the United States has shown an inclination to accentuate the separation of the two branches of practice, design and execution, and to place certain hindrances in the way of a mutual agreement and co-operation, though in many qualities and trades connected with building and industry our work cannot be surpassed.

THE ROYAL ACADEMY SCHOOLS PRIZE DESIGNS.

ON the whole the designs and drawings submitted for prizes by the Royal Academy Schools are not equal to the work of former years. The landscape painting examples are certainly unsatisfactory; there is much crudity in colour and composition, and the paintings awarded the prizes are distinctly the best, if not the only ones which deserve the award. The subject, "An Express Train at Sunset," for the Turner Gold Medal and Scholarship of £50, was a difficult one, because a train at all times is not a very picturesque object to handle in a landscape. Mr. John Hodgson Lobley has won the prize, and has certainly treated the subject cleverly and vigorously—a train passing over a bridge, while a number of railway navies are standing below. The other landscape subject, "A Bank of Ferns or Bracken," for the Creswick Prize, which has been won by Walter Percy Day, has not been done justice to by the majority of students, whose large cold green canvases often show a lack of harmony and gradation of colour. For the historical painting, "The Meeting of Diogenes the Cynic and Alexander at Corinth," the gold medal and travelling studentship of £200 has not been awarded, though No. 2 is the best in composition. The subject was difficult, and only one or two attempts can be said to be at all satisfactory. From painting we may turn to the architectural subject given this year, "A

Domed Church," for which the gold medal and travelling studentship (£200) has been awarded to Lionel Upperton Grace. The subject was a good one, though, taking the designs submitted, only one, the chosen design, has satisfactorily treated the problem. Mr. Grace's design exhibits unquestioned ability in the plan and general conception. It is dignified, though the proportions are not quite pleasing, and there is a heaviness in the general profile and details. The lower story or order looks weak, and the dome is rather heavy and depressed in outline; but these are points which could be improved. The general scheme is good. The author's plan is a rectangle, divided internally into three main or equal divisions in length, the central compartment being covered by a dome 40ft. diameter, supported on four massive piers. The dome and the western bay form the nave, and the chancel and sanctuary, terminating in an apse, form the eastern portion. There is thus internally a cruciform distribution of area, the north and south arms or transepts being cut off from the domical area by two columns under the main arches which carry the sides of dome. Above this colonnade which divides the domical area from the transepts, the walls on each side are carried up as a clerestory pierced by one large centre window, and these walls form the base of dome on the north and south sides, and become external walls between the cupolas which accentuate the four corners of the building. The effect of the clerestory thus being set back in the view gives variety to the composition, and breaks up the building at the side, and would assist the effect of light and shadow. The four corners of the plan adjoining the transepts crowned by cupolas above are on the west appropriated to an entrance to aisle on the north side, and to a baptistery on the south side of entrance. At the eastern end a memorial chapel occupies the northern corner and a morning chapel the south corner, both being finished with apsidal ends. The sanctuary being also apsidal, and covered by a half-dome, the plan assumes a triapsal termination. The west square-headed window over entrance is too wide and squat in proportion. The walls are rusticated. Internally the upper part is rendered rather heavy by the large spaces into which the domes are divided by ribs, and the lack of detail or sculptural enrichment. The square-headed windows which light the base of the dome are rather meagre. We hope to publish the design.

Design No. 161 is remarkable as a heavy Doric single-storied structure of massive character, rusticated with a centre circular drum, crowned by a flat dome. The external walls form a rectangle, broken on each side by two projections for stairs to crypt, verger's room, and baptistery, and between these are columnar side entrances. The dome, with the western part of nave and the choir and sanctuary, form a long internal rectangle, terminated by circular interior apses; but under the dome the sides curve outwards between the main piers, and are enriched by coupled columns, which divide the curves into three. The effect would no doubt be striking, and a large area would be obtained for seating. The high altar stands forward before the inner apse under a baldachino, and at the west end is a projecting portico of massive Doric columns. Externally the effect is extremely heavy, with the rusticated imperforated walls and attics and flat dome. The organ gallery is at the west end, and the choir is provided for in gallery round dome. There is some sculptural detail, and a group over west front is well shown. The design is essentially experimental, and we may say clever; but its undue severity of type is contrary to the spirit of modern church architecture. The inner dome, which rests on a peristyle, which forms an inner gallery round the dome, is a good feature. No. 162 is conceived in a Romanesque style.

It is cruciform in plan, with nave, transepts, and choir. The central dome over crossing rests on four square massive clusters of piers at each corner. The chancel has a circular end, and there is an ambulatory round altar screen. The west end is flanked by two towers, octagonal above, with cupolas, with a large, deeply-recessed wheel window, the curve of which is continued as a gabled end between the towers. The transepts also have similar windows. The details lack refinement. The nave, of two bays 40ft. wide, is the same width as the dome and the transepts. There are five steps up to choir, and the sanctuary is well raised. A clergy vestry is on north side at the end of aisle, and a morning chapel on the south side of chancel. The sittings are shown in plan.

No. 159 is an extraordinarily whimsical design. From a cluster of small domes springs a colossal pointed dome, pierced by traceried Gothic windows, and divided by heavy ribs of masonry. The horizontal bands of coloured material which are carried through the masonry of the lower cupolas give the design a very streaked appearance. The plan resembles one of a church at Cologne, the sanctuary and transepts terminated by circular ends, while smaller apsidal chapels open from the angles, and the general outline of section across transept is a trefoil. Other designs (Upper School) include one for village church on a hillside. No. 175 is simple and picturesque, with short towers at the east end, by side of chancel. The west elevation is simply treated, and the detail clever. No. 177 is a neat set with central tower. No. 180 is an artistic treatment with tower over choir. No. 171, a Secondary Technical School for 100 boys, shows an assembly hall in centre, with master's room behind; on left is a wing, with corridor leading to physics laboratory, and a cloak-room at end in front, and a similar wing on the right contains four classrooms; on the first floor are a chemical laboratory, lecture-room, store, dining-room, &c. No. 170 has some good points. No. 169, a Branch Insurance Office, is a well arranged plan, but commonplace in elevation. No. 167 is a design for a Morning Chapel next a cathedral, showing skill in Gothic (Decorated) detail, and William E. Brooks is awarded the prize of £25. There were also exhibited designs for a railway station, for a small country town, for a covered bridge, for a drinking fountain. Some of these show talent in conception, others in detail. The subject, "Plan of a General Hospital" (prize £10), has not been awarded. Four designs are submitted. 187 shows some careful study of pavilions and centre blocks, with long covered corridors. No. 188 is rather crowded. No. 189 has a fairly good general plan, with terrace connecting ward blocks, and No. 190 is a well-balanced plan, and the varied arrangements show some knowledge of the problem.

The perspective drawings on outline (open to architects only) represent the interior of hall of Eltham Palace, and indicate skill and industry in the constructional lines. The silver medal is awarded to Percy Ion Elton. The first silver medal for a set of architectural drawings of the interior of St. James's Church, Piccadilly, is won by Leslie Wilkinson, and a second by James de Caynoth Ballardie. The drawings represent a longitudinal and cross view of the church shown in section, and show the fine enriched plaster-vaulted ribbed ceiling over nave, and the cross-vaults over galleries. The silver medal and prize of £25 for a cartoon of a draped figure, subject "Victory," has been awarded to William E. Gladstone Solomon—a seated female figure, her right hand uplifted, and the left holding a deer-horn stringed instrument. The pose of figure is clever, and there is a triumphant expression in the face. The drapery is also well drawn. We hope to illustrate this work. The design for the

decoration of a portion of a public building, for which a prize of £40 was offered, has been won by Lillian Price Edwards, and a similar prize by Walter Ernest Webster for a clever composition, *proxime accessit*. The subjects given were generally appropriate, if difficult in some cases, and called out the powers of invention and composition of the students. In the competition for a model of a statue the silver medal has been given to a clever work by Louis Fritz von Roselieb; but the second medal was not awarded. The design for a commemorative medal of the Durbar, by Henry William Page, gained a silver medal.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary fortnightly meeting of the Royal Institute of British Architects was held on Monday evening, at 9, Conduit-street, W. There was an unusually numerous attendance of members, brought together by the introduction of a keen discussion on Plenum v. Natural Ventilation, as applied to hospital construction. Owing, however, to the length and detailed character of the papers read, and the time taken by the speakers first called upon, this expectation could not be realised, and it remains to be seen whether the Council of the Institute will be able to accede to the requests of those who asked that a second evening should be devoted to the subject early in the New Year. The President, Mr. Aston Webb, R.A., F.S.A., occupied the chair, and in opening the proceedings, proposed a vote of condolence to the family of the late Mr. Charles Fowler, Fellow, who was beloved by many in that room. His father was one of the founders, and for some years one of the hon. secretaries, of the Institute. The gentleman just deceased was for many years surveyor to the Portland Estates, a position from which he retired a year or two since. He was a very active worker at the Institute, on whose Council he served, and he was also a member of the Board of Examiners. The deaths were also announced of Mr. William Warlow Gwyther, of London, Fellow, and of Mr. Nathaniel Young Armstrong Wales, Fellow, of Dunedin, New Zealand.

THE ROYAL VICTORIA HOSPITAL, BELFAST: ITS INITIATION, DESIGN, AND EQUIPMENT.

Two papers were read on this subject by Mr. WILLIAM HENMAN, of Birmingham, the architect, and Mr. HENRY LEA, the engineer of the hospital described. Plans and sections were hung on a screen, and about a score of lantern slides, showing the plan, construction, and actual building, were exhibited. Mr. Henman said there was much that was unique in its inception, original in its design, and novel in its equipment, which had attracted attention to the Royal Victoria Hospital, Belfast. It seemed, therefore, advisable that an authentic description should be published of the reasons which had led to what had been termed

A "REVOLUTION IN HOSPITAL DESIGN,"

as well as of the methods and means by which it had been accomplished. If the plan was revolutionary in its tendency, he hoped to show that it was a serious endeavour to simplify, and, if possible, to improve, hospital design. Whether it was destined to secure permanent approval, or be pointed at as an example to be avoided, depended upon, first, whether the essentials in hospital design had been properly appreciated and applied; secondly, whether those having the care and management of the institution would maintain it in efficiency. As regards the development of the design in question, distinct variations in hospital planning had been principally brought about as knowledge increased of the necessity for efficient ventilation and of the means by which it could be secured. Hence, with mechanical means at their disposal, an attempt was made at Belfast to design a hospital that could be efficiently ventilated by such means. The author acknowledged his indebtedness to Mr. William Key, of Glasgow, who had proved the possibility of securing efficient ventilation on the plenum system—the system which had been adopted at the hospital. The wards of a hospital are occupied both day and night by patients in a low state of health, and continuous change of air, with an equable temperature and freedom from draughts, secured without noise or dirt, is necessary to the cure of the patients. The question therefore is, How can hospital wards be

designed and arranged so as economically and effectively to secure the desired conditions? Reference was made to correspondence which had appeared in a contemporary, suggesting that in consequence of the proved success of plenum ventilation, combined with antiseptic treatment, it might be possible to dispense with the "pavilion" arrangement of wards, and advocating double wards divided longitudinally by dwarf partitions. This idea had seemed to the author altogether wrong, and he had set forth his views in a letter to that journal of Aug. 8, 1896. Here he suggested that, "instead of erecting detached pavilions of several stories, it might be better to spread out the wards on one story only, placed side by side and lighted by continuous lantern lights. Such an arrangement would secure greater comfort to the patients, simplify ventilation by mechanical means, and very considerably reduce corridor communication, as well as dispense with the inconvenience of staircases and lifts, thereby facilitating administration. For the accommodation of the staff there would be no objection to buildings of several stories, but with all the patients compactly arranged on one floor level their wants could be easily supplied, and other difficulties of the pavilion plan would be overcome." The letter concluded: "Only those who study what is possible with the plenum system of ventilation properly applied can realise the practicability of such an arrangement; yet by its employment I feel convinced that some such revolution in hospital planning will be accomplished, and do not doubt that in time it will be demanded, partly in consequence of the great cost of the pavilion plan, but more particularly in consequence of the excessive labour thereby involved."

THEORY TESTED BY PRACTICE.

When the author was requested to meet the Committee of the Royal Victoria Hospital, Belfast, reference was made to the suggestions contained in the above letter, and he was questioned as to the practicability of constructing a hospital such as he had proposed. On attempting to fit together, on entirely new lines, the intricate requirements of a complete hospital for 300 patients and a large staff, he began to realise the difficulties he had imposed upon himself. With the assistance of his partner, Mr. Thomas Cooper, the plan in time, however, assumed the generally symmetrical arrangement in which it now appeared in the erected building.

OPPOSITION TO THE PROPOSALS.

The author referred to the opposition raised against the scheme before it was finally sanctioned by the committee. Professor Byers, Member of Council of the British Medical Association, and honorary member of the medical staff, averred that, "when first he heard that it was proposed to place all the wards side by side without intervening open spaces, to light them principally from above, and to have no windows to open, it appeared to him so contrary to all his preconceived ideas on hospital design that he determined to oppose the carrying out of such a plan by every legitimate means, and, to enable him to do so effectually, he set about independently to study the subject in all its bearings; but, to his surprise, the more thoroughly he probed it, the more and more convinced he became that Mr. Henman was right."*

THE GENERAL DESIGN.

The cost of the buildings, including all engineering requirements and a complete steam laundry, was but a trifle over £300 per patient's bed—proof that the arrangement of plan is capable of being carried out at an economical figure. The site is six acres in extent, to which another six is to be added. The hospital stands comparatively high, has a pleasant outlook in every direction, and is readily accessible from most of the large manufactories and works, and from the poorer parts of the city, whence the majority of the patients will come. From west to east there is a fall in the level of the ground of over 20ft., of which advantage has been taken; by keeping the main floor level well above the ground adequate height is secured for the principal fresh-air duct, which runs under the main corridor, for the branch ducts conveying fresh

* Asked recently for his personal experience of the working of the hospital, Professor Byers said that the building "more than fulfilled his expectations; the plenum system worked admirably, and whether from the point of view of administration, ease and comfort of patients, or adaptability to clinical teaching, he knew no hospital equal to it."

air to the several wards and accessory rooms, also for a pipe-duct running parallel with the principal air-duct—a necessary provision, so that heat from the steam and hot-water pipes may not penetrate the buildings during the summer months, and that convenient access may be obtained to all piping. Opening directly from the hall opposite the porch entrance runs the main corridor from east to west, some 450ft. long and 9ft. wide. Branching southward are seventeen short corridors, giving access to as many wards, each with fourteen beds, with their accessory rooms, all practically under one roof. The eight wards to the east are for medical cases; then come eight wards for surgical cases, and one for gynaecological cases. To the north are two for ophthalmic cases. The author described

THE GENERAL ARRANGEMENT

of the rooms, male and female wards, classrooms, clinical rooms, operating-rooms, ward kitchens, storerooms for clothing, nurses' and cleaners' rooms, sanitary conveniences, &c.; also the "Extern," or out-patients' department, with its waiting-hall and medical, surgical, and specialists' consulting-rooms, examination-rooms, dispensary, &c. Intercepting lobbies between wards and conveniences are dispensed with. Open windows with plenum ventilation are objectionable, and without open windows intercepting lobbies are an anomaly. By a simple adjustment air from sanitary turrets is prevented from entering the wards, air-pressure in their direction being maintained from the wards outwards. To the ward kitchens no doors are provided. With plenum ventilation an equable temperature and freedom from draught are secured, consequently inner doors are required only for the sake of privacy, or where difference of temperature is desired to be maintained. Two small detached buildings at the west end of the site are for isolation purposes. They receive fresh air by a continuation of the main duct underground, and, although at least 600ft. away from the fans, are amply supplied with fresh air.

CLERESTORY LIGHTING.

The author showed sections through a portion of the ward-block to give a general idea of the method of lighting and of the construction adopted. The windows are not skylights, as generally understood, but may be more properly defined as clerestory windows, slightly sloping (at an angle of 60° to the horizon), and glazed with $\frac{1}{16}$ in. plate-glass. The result is most perfect lighting to every portion of the building. Surgeons using the operating-rooms state that nothing could be better for their purpose: the light is ample, well-diffused, and practically free from shadowing. An advantage of plenum ventilation not always appreciated is that the cubical contents of buildings may be very considerably reduced. Given sufficient floor area for nursing and teaching purposes, the height of wards need be no more than appearance demands, and when lighted as they are in this instance the cubical contents are much reduced, being not more than two-thirds of what is ordinarily required, thereby effecting a considerable saving in cost.

FITTINGS AND APPOINTMENTS.

After referring to the administrative buildings, the author described the various fittings and appointments of water-closets, sinks, bathrooms, operating-rooms, post-mortem rooms, pathological and microscope rooms. The whole of the sanitary appliances were carried out from the architect's designs by Messrs. Morrison and Ingram, and fixed by Mr. John Dowling, plumber, of Belfast. Mr. Henman concluded with

A WORD OF CAUTION

about plenum ventilation. It is essential it should be applied with full knowledge and by those competent to deal effectively with it. Distrust an engineer who will give a scheme for ventilating any building indiscriminately on the "plenum" or "extraction" system, or by what are termed natural means; but try to realise that every building should be designed for the particular method of ventilation intended to be employed, and that the means for procuring ventilation must be specially designed on scientific principles to meet the actual requirements of the building.

THE ENGINEERING WORK OF THE BELFAST HOSPITAL.

Mr. HENRY LEA, M.Inst.C.E., who followed with a paper on this portion of the subject, also illustrated by many lantern slides, speaking of the ventilation, said that the design which

Mr. Henman had originated facilitated to an extraordinary degree a simple arrangement of air-ducts of ample proportions. To emphasise the importance of this point, he mentioned two large buildings now ventilated by mechanical means, each requiring about 13 million cubic feet of fresh air to be driven through them per hour. In one building, owing to the liberality with which the air-ducts are proportioned, the total amount of power required to drive the fans was 191 H.P.; in the other building, owing to the air-ducts being restricted and very crooked, the power required was 531 H.P. Putting this into money value, in one case the electrical driving-power cost £766 per annum, and in the other £2,164 per annum. The main air-duct at the Belfast Hospital, at the end nearest to the fan chambers, has a height of 20ft. and a width of 9ft. The full width is preserved to the far end of the wards block, a distance of 443ft.; but the bottom slopes upwards, so that the height is diminished to 6ft. at the far end. The total cubical capacity of the hospital buildings ventilated on the plenum system is 703,003 cu. ft. With seven changes of atmosphere per hour in the winter the velocity of the air entering the main duct is 7.06ft. per second, and with ten changes per hour in the summer, the velocity is 10.85ft. per second. The proportions of the branch ducts and of the vertical air-flues are based upon similar liberal lines, as are also the air-ways through the fan chambers and the water-screens. This accounts for the reduction of power for working the system. Another point in relation to economical working is that the fans are driven by a steam-engine, the exhaust steam from which is utilised for heating the water for the baths and lavatories. The lecturer showed that there was a saving under this head of £275 per annum.

HOT AND COLD WATER SUPPLY.

The main engineering features in connection with the ventilation of the hospital having been fully detailed, the lecturer treated of the arrangements for hot and cold water supply. The supply of cold water is brought from the cold water cistern in the roof of the east wing, and is connected to the return pipe, so that the cold water, after passing through the rotary pump, enters and is heated by the two steam calorifiers before it passes to the various portions of the building. The general arrangement of the hot-water circulation, which was described in considerable detail, includes two hot-water cylinders, each containing 900 gallons of water. To the system of circulation are connected eight subsidiary circulations under the ward block, for the purpose of supplying the baths and lavatories in that block. Other subsidiary circulations are also provided for the ophthalmic block, the extern, and the administrative block. All the hot-water mains and the branch circulations are covered with non-conducting composition. The effect of the rotary pump is such that the hot water is caused to circulate through the whole system about once every fifteen minutes, which insures evenness of temperature. The system of cold-water pipes follows substantially the course of the hot-water pipes, with the exception that no circulation arrangements are provided. Wherever the cold-water mains and pipes are exposed to cold air they are covered with non-conducting composition to protect them from frost. In each of the operating-rooms is an apparatus for sterilising water for surgical purposes. The water for these purposes is first warmed by means of a steam coil, and is then passed through a Berkefeld filter, which frees it from every kind of microbe, and is thereby rendered innocuous for surgical use. The temperature is regulated with the greatest facility.

THE LAUNDRY

is designed so that the articles to be cleansed go through the consecutive stages of treatment without being carried over the same ground twice. The ordinary type of machinery is employed. The exhaust steam from the laundry engine is used to heat the drying closet and water for the washhouse. A fan draws air from the ironing-room, forces it through the heating coils of the drying closet, and thence into the washhouse, upon the steamy atmosphere of which it has a beneficial effect.

ELECTRICITY FOR LIGHTING

is supplied from the two mains. The system of wiring is that which is now well known and generally used, but which the author believes he was the first to use—namely, placing a suitable

number of fuse-boxes about the building; using the same sized sub-mains throughout for supplying the fuse-boxes; using the same sized fuses in all the fuse-boxes; placing not more than five 60-watt lamps on each fuse for 100 volts, or eight lamps on each fuse for 220 volts; and using the same sized lamp leads throughout the whole building. The total number of 16c.p. lamps, or the equivalent, installed in the establishment is about 1,100.

Sir JOHN C. HOLDER, BART., Chairman of the Committee of the Birmingham General Hospital, at the call of the President, proposed a vote of thanks to Messrs. Henman and Lea. When, he said, it was decided to rebuild the hospital in Birmingham, a competition was instituted, and on the recommendation of Mr. Alfred Waterhouse, the assessor, the design sent in by Mr. Henman was adopted. Its author was appointed architect, and had carried out the undertaking most satisfactorily, not a single drawing in the actual work having to be altered or amended after it had once been submitted to the committee. As originally designed, the institution was intended to be ventilated by a natural system; but the speaker received letters from friends asking him to examine into the merits of the plenum method. Eventually he went to Glasgow to see the system in operation, and was so impressed by it that he persuaded the members of his committee to accompany him on a second visit, with the result that they were even more pleased with its working than he had been. He and his friends went over some Board schools in Glasgow, in a poor district and on a wet, muggy day, and could perceive in the rooms no smell of wet clothes, while the teachers and head-masters spoke highly of the system. They thereupon decided to adopt Key's plenum method for their new hospital, and the committee were very pleased with its operation. In the coldest weather the internal temperature stood at 59°, and in the height of summer it had never risen beyond from 68° to 69° Fahr., while there seemed to be a constant supply of fresh air alike to patients and nurses. Another point was that when the infection of measles and of scarlet fever had been accidentally introduced—a trouble to which general hospitals were very liable—they had not proved contagious, and the disease was isolated without further trouble. When in the United States and Canada he had inspected the famous Johns Hopkins Hospital at Baltimore—which now proves far behind the time—the McGill University Hospital at Montreal, and the Presbyterian hospital at New York; but none of these institutions were equal to the one at Birmingham, which was spoken highly of by the late Sir William McCormack. He might explain that the Birmingham Hospital was on the pavilion plan, and had been ventilated on the plenum system, from plans by Messrs. Henman and Lea. The cost of upkeep had been reduced to a minimum, that of working the fans, &c., being only £600 a year. The Belfast scheme was a later and very bold one, the special points to his mind being the method of keeping all the wards close together, and with the lowest possible walls.

DR. CHRISTOPHER CHILDS seconded the vote of thanks to the lecturers. He was strongly convinced that for many purposes the plenum system was the best method of ventilation; but he should have liked to have had more detailed particulars as to the actual dimensions of the inlets and outlets adopted at Belfast. In many plenum installations he had inspected, there had seemed to him grave defects in the relative positions and sizes of the inlets and outlets, and it seemed to him that no definite principles had been laid down as to the most important details. He was sorry, having said that much, to strike a discordant note, but he was not sure that it afforded sufficient fresh air for hospitals and schools. They all recognised the necessity for a full supply of pure air. It was easy to test the atmosphere and ascertain the relative proportion of carbonic-acid gas in a volume of air, and also to count the microbes; but hitherto analysts had failed at one point—in showing them whence came the invigorating qualities which they all recognised as present in fresh air. These health-giving qualities seemed to him to be lacking in air pumped into a building under a plenum system, and to be present in methods of natural ventilation. The value of fresh, not filtered or pumped, air was obvious in the treatment of cases of phthisis, and all recognised its exhilarating effects—

Mr. HENMAN, interrupting with great warmth,

said the speaker clearly did not know anything about the subject. (Cries of "No, no.") They were there to discuss the application of a plenum system to a particular building, and how far it had been successful, as to which this gentleman knew nothing, and not to talk of the general question of fresh air. He protested, at that late hour, of the time being so taken up with other matters.

The PRESIDENT said Dr. Childs was perfectly in order and to the point, and would he please continue?

Dr. CHILDS added that he was a strong advocate of the plenum system for certain purposes; but he would not allow that it was the best for hospitals, as patients needed the stimulus of absolutely fresh and frequently changed air.

Mr. ALFRED SAXON SNELL asked whether the council would arrange for a second evening to be devoted to discussing this extremely important question. The system that had been advocated that evening had the attraction that attached to something novel; but he and others believed it to be, so far as they had investigated it, a huge mistake. He moved the adjournment of the discussion.

Mr. H. T. HARE, P.A.A., seconded the motion for adjournment.

The PRESIDENT said they had all been deeply interested in the novel suggestions for hospital construction brought forward in the papers read. If the Council could arrange it, they would allot a second evening to discussing so important a question; but there were great difficulties in the way, not only in providing the time, but in getting such an audience together again. They had been extremely interested in hearing of the manner in which the difficulties presented by the Belfast hospital had been overcome. The idea of packing all the patients together on one floor and under one low roof was novel, and there were obviously enormous advantages to the staff, provided that the plenum system allowed, as Dr. Childs had suggested, a sufficient supply of fresh air. The advantage of a plenum system was that it was possible to regulate the amount of air passing into and out of a room. Whether there were greater disadvantages to counterbalance this could only be ascertained when the question was threshed out in discussion, and he hoped it would be possible for the Council to arrange another meeting in order that they might hear both sides. The President put the vote of thanks, remarking that they were under exceptional obligations to Messrs. Henman and Lea for having brought forward and explained so novel a system of construction.

Mr. HENMAN, in reply, said it was clear Dr. Childs had never properly investigated the plenum system in actual operation. If Dr. Childs were to go into a well arranged hospital ventilated by this method either by day or by night, he would find the atmosphere equally pure, whereas when the speaker had inquired of nurses in institutions ventilated on the natural system of the conditions of the air during the night, they admitted that it was not fresh, as the ventilators were never kept open, and in one case he was frankly informed that at night the air of the wards was stinking. Since, under the plenum system as carried out by him, the air in a hospital was changed seven times per hour in winter and ten times per hour in summer, the atmosphere must be better, it stood to reason, than where natural ventilation was relied upon, under which the air was only changed three times per hour.

Mr. LEA also replied briefly, and offered to attend an adjourned meeting whenever arranged, and give the details of construction that had been asked for.

THE REGISTRATION QUESTION.

The PRESIDENT announced that the next assembly of the Institute would be on Monday, January 4, and would be a business meeting of members only, to discuss a memorial which the Council had received, duly signed by Messrs. G. A. T. Middleton, Butler Wilson, J. W. Beaumont, John Woolfall, Edgar G. C. Down, and H. Davis, in which they state that they propose to bring forward the following motions, viz.:—

1. That this Institute is in favour of the general principle of the Compulsory Examination and Registration of Architects.

2. That a Committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a special general meeting before the opening of Parliament.

3. To nominate this Committee.

The PRESIDENT added that he trusted that

those who were interested in the question, both for and against, would attend, that they might hear both sides fully discussed.

ROYAL ACADEMY SCHOOLS.

THE prizes awarded to the successful students of the Royal Academy Schools were distributed at Burlington House on Thursday evening in last week. In the absence, through indisposition, of the President, Sir E. J. Poynter, the distribution was made by Mr. Ernest Crofts, R.A., Keeper of the Academy, and there were present most of the Academicians and Associates, together with a large number of the relations and friends of the students. The following is the prize list: Historical painting (the meeting of Diogenes the Cynic and Alexander at Corinth, *cf.* Plutarch, Alex. c. 14), gold medal and travelling studentship (£200), not awarded. Landscape painting (an express train at sunset), Turner gold medal and scholarship (£50), John Hodgson Lobley. Land cape painting (a bank of ferns or bracken), Creswick prize (£30), Walter Percy Day. Painting of a figure from the life (open to male students only), silver medal, 1st, William Charles Penn; silver medal, 2nd, William E. Gladstone Solomon (disqualified owing to having received the same prize before). Painting of a head from the life, silver medal, 1st, Walter Percy Day; silver medal, 2nd, John Holman Wybrandts. Painting of a draped figure (open to female students only), silver medal, 1st, Catherine Oulless; silver medal, 2nd, Marjory Violet Watherston. Cartoon of a draped figure, silver medal and prize (£25), William E. Gladstone Solomon. Design in monochrome for a figure picture (Elijah Cursing Ahab and Jezebel in the Vineyard of Naboth, 1 Kings, chap. xxi.), Armitage prize, 1st (£30) and bronze medal, not awarded; Armitage prize and bronze medal, 2nd (£10), not awarded. Design for the decoration of a portion of a public building, prize (£40), Lilian Price Edwards: *proximo accessit*, Walter E. Webster. Set of six drawings of a figure from the life (open to male students only), 1st prize (£50) and silver medal, William E. Gladstone Solomon; 2nd prize (£25), William Charles Penn; 3rd prize (£15), Thomas Dargan Philpot; 4th prize (£10), William George Simmonds (disqualified owing to having received the same prize before). Drawing of a head from the life, silver medal, 1st, not awarded; silver medal, 2nd, Francis E. D. W. Fitzjohn Crisp. Drawing of a statue or group, silver medal, 1st, not awarded; silver medal, 2nd, not awarded. Perspective drawing in outline (open to painters and sculptors only) (Mr. Willoughby's temple in Sir William Chambers's "Architecture"), silver medal, no competition. Composition in sculpture (three generations), gold medal and travelling studentship (£200), Arthur Charles White. Model of a design (David cutting off Goliath's head, 1 Sam. chap. xvii. verse 51), 1st prize (£30), Leonard Jennings; 2nd prize (£10), Frederick Brooke Hitch (disqualified owing to having received the same prize before). Set of four models from the life (open to male students only), 1st prize (£50) and silver medal, Frank Ransom; 2nd prize (£20), George Gilbert Walker. Design for a medal (to commemorate the Durbar, with an allegorical figure of India on the obverse), silver medal, Henry William Page. Model of a bust from the life (open to female students only), silver medal, 1st, no competition; silver medal, 2nd, no competition. Model of a statue or group, silver medal, 1st, Louis Fritz von Roselieb; silver medal, 2nd, not awarded. Design in architecture (a domed church), gold medal and travelling studentship (£200), Lionel Upperton Grace. Set of architectural drawings (the interior of St. James's Church, Piccadilly), silver medal, 1st, Leslie Wilkinson; silver medal, 2nd, James de Caynoth Ballardie. Set of architectural designs (upper school), prize (£25), William Edward Brooks. Set of drawings of an architectural design (lower school), prize (£10), George Forsyth. Plan of a building (a general hospital), prize (£10) not awarded. Original composition in ornament, silver medal, no competition. Perspective drawing in outline (open to architects only) (interior of the hall at Eltham Palace, Kent, looking eastward), silver medal, Percy Ion Elton. The Landseer scholarships in painting and sculpture, of £40 a year each, tenable for two years, have been awarded—in painting, to Walter Percy Day and Ernest Stafford Carlross; in sculpture, to Frederic Charles

Chrisfield. The galleries containing the competition works were open to the public on Friday and Saturday last.

The Secretary (Mr. Fred A. Eaton) read the President's address, in the course of which Sir Edward Poynter said that the Royal Academy had recently made some very considerable and important changes, which should have a very far-reaching effect, in the conditions under which admission was granted to those schools, and in the course of study which they and future students would pursue while there. It was thought by many members of the Royal Academy that much was taught there with which candidates for admission should be conversant before entering the schools, and that by omitting the more elementary stages of instruction subjects of study could be introduced for which there had not hitherto been sufficient time or opportunity, and after long and serious consideration, extending over some two years, the Academy had formulated the system of study which was embodied in the new regulations, and which came into working for the first time at the beginning of the present term. The changes made were in some respects so sweeping that some little time might be required to get the system into working order, and it was conceivable that some modifications in the direction of a return towards former arrangements might be found desirable. Much would depend on what capacity schools in which candidates received their preliminary instruction might develop towards meeting their requirements. The most valuable effect of this change, if the higher standard for admission which was demanded under the new rules was properly insisted on, ought to be in raising the quality of instruction in other schools of art.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.

ON December 9, 1903, before a large attendance, Mr. E. J. Steadman, of the Lumière N.A. Co., Ltd., gave a demonstration of colour photography, dealing first with the theory of the subject and the colours of the spectrum. He then described the process advocated by the Lumière Co., in which three negatives are taken, the first through a blue screen on an ordinary plate, and the others through red and green screens respectively on specially prepared plates which are sensitive to these colours. These negatives are printed on a bichromated gelatine emulsion spread on celluloid or talc, giving a barely visible image, which is developed in hot water and fixed in hypo in the usual way, leaving a clear film with almost invisible image. The film is then dried and dyed in a complementary dye; that is, the print from the negative taken through the blue screen is dyed green, that through the red screen blue, and that through the green screen red. These prints are then superimposed and the dyes adjusted, the blue print being taken as the basis, and the other dyes either intensified by further dyeing or reduced by washing until a perfect transparency in natural colours is obtained. For prints a thin flat bromide print is made from the negative taken through the red screen and toned with iron to a blue tint. Dyed positives on a stripping film are then made from the other negatives and squeezed one at a time, the blue print dried and the talc support stripped, the result being a paper print in natural colours. The exposure required for the three negatives is—through the blue screen four times the ordinary exposure, through the green screen six times, and through the red from eight to ten times. A white object should be in the picture as a guide when developing, because its density will be the same in all three negatives, and the negative taken through the blue screen should be taken as the standard for density when developing, as it is least sensitive to the ruby light of the dark room. Prints showing the various dyes and the combined result were then handed round and discussed. Mr. Steadman composed two prints from their separate parts during the discussion, to show the ease with which the superimposition was made. The lights were then turned down, and a short demonstration of the theory of colour was given by means of the lantern, after which a remarkable series of photographs of landscapes, fruit, still life, and architecture was shown, which had been prepared in natural colour by the Lumière Co.

Mr. Louis Ambler, in proposing a vote of thanks to Mr. Steadman, referred to the crudeness of colour and lack of atmosphere in the

photographs of landscapes shown, and was informed that this was at present unavoidable, but, very curiously, was only found in landscape work. Mr. Stenhold, in seconding the vote of thanks, suggested the use of the process in photographing stained glass and other coloured decorations in buildings.

Mr. Wonnacott put the vote of thanks to the meeting, and gave a brief *résumé* of the history of colour photography, afterwards inviting the members of the Camera Club to be present as his guests at Sir William Abney's lecture on "Colour Photography" at the Royal Photographic Society on Dec. 14.

After Mr. Steadman's reply the meeting terminated, fully impressed with the practical value of the Lumière Co.'s process.

TOWN SUBWAYS.*

By R. M. PARKINSON.

(Concluded from page 790.)

METHOD OF CONSTRUCTION.

THE walls have been shown as of concrete, because, owing to the cheapness of ballast and cement in London, this is the best material to use there, but brickwork with brindle facing, in damp situations, would be better in many places. The side walls should be first put in, trenches of their exact width being excavated and filled in with concrete, and no attempt should be made to give a smooth face. Trenches should then be cut across the road for setting the girders, and these latter should be covered over with packing-blocks 9in. deep, on which two thicknesses of $\frac{1}{4}$ in. planks should be laid, the planks in the second layer to take the traffic being parallel to the girders. The 9in. packing-blocks are provided to enable the planking to be laid quite clear of the road metal, which can be removed from between the girders to put in the concrete arches without trouble. After the girders and temporary flooring-boards have been fixed the ground below may be removed for a depth of 6ft. or 7ft., at which level, 12in. by 12in. timbers should be put across from wall to wall 12ft. apart to keep all secure till the invert has been put in. The concrete arches can be constructed from below without removing the temporary flooring; but it is necessary to close half the street for the laying of the flooring blocks. It would be simpler to refill the road metal over the girders along one side of the street and close the other, form the concrete arch on the earth as a centre, and then do the paving and reopen; but some time must be allowed for the concrete to set, and so the street would be blocked for a much longer period than is required for laying the paving alone; also as the work would have to be done from the top, the streets would be more blocked by the extra traffic, whereas if done from below, the earth would be taken right away and the concrete materials brought up from the tunnel. The old pipes would have to be slung or strutted up until they could be diverted. For the first length undertaken new pipes would have to be provided, and the old ones utilised for the second length, and so on, temporary connections being made where necessary. Should any old pipes come within 2ft. of the surface, the girders must be packed up over them temporarily, and afterwards lowered down to their right level, and if they come even higher, 12in. by 12in. timbers must be used in place of girders temporarily. During construction the subway will be so full of old and new pipes running in every direction that only small 2ft. gauge waggons will be able to be used. These can, however, tip into large waggons in the finished part of the subway, the permanent tramway being laid in for this purpose as soon as possible.

ESTIMATES.

The estimates given below have been prepared on the following basis:—The excavation, including timbering and a moderate amount of pumping, has been put at 4s. per cubic yard, except in Schemes 2 and 5, where it has been put at 2s. and 3s. respectively. The removal of the surplus is put at 2s. 3d. per load, or 3s. per cubic yard, in all cases. The 8 to 1 concrete price has been obtained thus:—

* Prize Essay on the Prevention of the Breaking Up of the Streets during the Laying of Water and other Pipes and Conduits, for the Worshipful Company of Paviers.

1 ton of cement, including bags, carting, and storing, at 31s. 6d.	4 6
1 1/2 yard ballast, including carting, at 6s.	7 6
Labour	2 6
Plant, supervision, and contingencies	3 6
	18 0

The prices for the paving, kerbing, and the gas and water pipes are for labour and cement or lead, as the case may be, only. The prices for the pipes are made up as follows:—

	6in.	9in.	12in.	15in.
Earthenware pipes	0 9	1 9	3 0	5 2
Cement, sand, and yarn	0 0 3/4	0 1 1/4	0 2	0 2 1/2
Labour	0 3 1/2	0 4	0 5	0 6
Contingencies, &c.	0 1 1/2	0 3 1/2	0 5	0 5 1/2
Total	1 3	2 6	4 0	6 4
Internal diameter	4in.	6in.	15in.	18in.
Lead and yarn	0 5	0 7	1 4	1 8
Labour	0 4	0 6	1 6	2 0
Contingencies, &c.	0 3	0 5	0 8	0 10
Total	1 0	1 6	3 6	4 6
Internal diameter	2 1/2in.	2 1/2in.	2 1/2in.	3 1/2in.
Lead and yarn	2 2	2 8	3 4	5 0
Labour	2 6	3 3	4 0	6 0
Contingencies, &c.	1 0	1 4	1 8	2 0
	5 8	7 3	9 0	13 0

The tramway may be estimated thus per lineal yard:—

16in. gauge with 6lb. sleepers	2 6
18in. " " 7lb. "	2 7
24in. " " 10lb. "	2 9

The price in schemes 6, 7, and 8 is obtained thus:—

1 cwt. nails, at 6s.	6 0
4lb. fishplates and bolts, at 1d.	0 4
12lb. fancy bolts and straps, at 1 1/2d.	1 6
3 feet cube creosoted timber, at 2s. 4d.	7 0
1 yard lineal labour in laying	0 8
Total	15 6

SCHEME NO. 1.—FIGS. 1 AND 2.			
	s. d.	£ s. d.	
10 yards cube excavation	7 0	3 10 0	
5 " " cement concrete	18 0	4 10 0	
0 1/2 " " sand ballast	6 0	0 2 0	
2 " " super. 3in. York flagging	2 0	0 5 0	
2 " " centring to concrete arch	1 6	0 3 9	
1 " " lineal granite kerb	—	0 1 4	
1 " " 12in. sewer	—	0 4 0	
0 1/2 " " 9in. pipes in walls	2 6	0 0 5	
0 1/2 " " 6in. pipes to gulleys, &c.	1 3	0 0 8	
1 " " 4in. surface drain	—	0 1 0	
0 1/2 " " 3in. pipes in walls	—	0 0 2	
2 " " 1 1/2in. gas & water mains	4 6	0 9 0	
2 " " 4in.	1 0	0 2 0	
1 " " 5in. hydraulic main	—	0 2 0	
4 " " 4in. electric-wire boxes	0 6	0 2 0	
1 " " 16in. tramline	—	0 2 6	
No. 1/100 15in. gully	—	0 0 6	
No. 2 blue pressed bricks in cement	0 1 1/2	0 0 3	
No. 1/2 sets wedges and blocks	1 0	0 0 2	
No. 1/2 stoppers to 9in. pipes	1 0	0 0 2	
14lb. steel and iron in joists of straps	0 3	0 3 6	
	£10 0 5		
Contingencies 20 per cent., say	—	1 19 7	
Amount of estimate	—	£12 0 0	

SCHEME NO. 2.—FIGS. 3 AND 4.			
	s. d.	£ s. d.	
5 yards cube excavation	5 0	1 5 0	
1 1/2 " " cement concrete	18 0	1 7 0	
2 1/2 " " super. 3in. York flagging oew.	6 0	0 15 0	
4 " " boarding to concrete arch and side walls	1 6	0 6 0	
1 " " lineal granite kerb	1 0	0 1 0	
1 1/2 " " 4in. channel pipes	0 8	0 1 0	
0 1/2 " " 3in. pipes in wall	—	0 2 0	
1 " " 15in. gas main	—	0 3 6	
1 " " 5in. hydraulic main	—	0 0 2	
2 " " 4in. gas and water mains	1 0	0 2 0	
1 " " 16in. tramline	—	0 2 6	
No. 1/100 gully and drain	—	0 0 6	
3 blue bricks in cement	1 2	0 0 5	
1/2 sets, wedges, and blocks	1 0	0 0 2	
7lb. steel and iron in joists and straps	0 3	0 1 9	
	£4 8 0		
Contingencies	—	1 2 0	
Amount of estimate	—	£5 10 0	

FIG. 4.			
	s. d.	£ s. d.	
1 1/2 yards cube excavation	5 0	0 7 6	
0 1/2 " " cement concrete (8 to 1)	18 0	0 13 6	
1 1/2 " " super. 3in. York flagging new, less cr.	8 0	0 10 0	
2 " " boarding to concrete face	1 6	0 3 0	
1 " " lineal forming channel in invert	—	0 0 6	
2 " " 4in. gas and water mains	1 0	0 2 0	
1 " " silicate concrete to water mains	—	0 2 6	
4 " " 3in. slate slabs for wire channels	0 9	0 3 0	
	£2 2 0		
Contingencies	—	0 8 0	
Amount of estimate	—	£2 10 0	

SUMMARY.		£ s. d.
Fig. 3	.....	5 10 0
Fig. 4	.....	2 10 0
Total amount of estimate	.....	£8 0 0

In this scheme the cost of boring for the house connections is saved. The 3in. boring, including tubes, will cost 8s. per foot, and the 4in. about 10s.

SCHEME NO. 3.—FIG. 5.			
	s. d.	£ s. d.	
13 yards cube excavation	7 0	4 11 0	
6 " " cement concrete	18 0	5 8 0	
0 1/2 " " sand ballast	6 0	0 4 6	
1 " " super. 1in. plankings	—	0 2 3	
5 1/2 " " boarding to concrete	1 6	0 8 3	
4 " " rolling roadway surface	0 9	0 3 0	
1 " " lineal 12in. sewer	—	0 4 0	
1 1/2 " " 4in. drainpipes	1 0	0 1 6	
0 1/2 " " 9in. " to gulleys, &c.	2 6	0 1 3	
2 " " 24in. water and gas mains	7 3	0 14 6	
3 " " 4in.	1 0	0 3 0	
1 " " 5in. hydraulic main	—	0 2 0	
2 " " forming channels for wires	—	0 1 6	
1 " " 18in. tramline	—	0 2 7	
No. 1 1/2 sets wedges and blocks	1 0	0 0 4	
No. 1/2 stoppers to 9in. pipes	1 0	0 0 2	
28lb. steel and iron in joists and straps	0 3	0 7 0	
	£12 15 0		
Contingencies	—	2 5 0	
Amount of estimate	—	£15 0 0	

SCHEME NO. 4.—FIG. 6.			
	s. d.	£ s. d.	
5 1/2 yards cube excavation	7 0	1 18 6	
0 1/2 " " cement concrete	20 0	0 10 0	
0 1/2 " " lime grouting	20 0	0 5 0	
1 yards lineal provision and working of shield	—	3 0 0	
1 " " 12in. sewer	—	0 4 0	
1 " " 9in.	—	0 2 6	
0 1/2 " " 6in. drains to gulleys, &c.	1 3	0 0 2	
1 " " 6in. half-drains to gulleys, &c.	—	0 1 0	
1 " " 2in. gas main	—	0 5 8	
1 " " 15in. water main	—	0 4 6	
2 " " 4in. gas and water mains	1 0	0 2 0	
4 " " 3in. tiles for wires	0 9	0 3 0	
2 " " 3in. grooves	0 6	0 1 0	
1 " " 18in. tramway	—	0 2 7	
0 1/2 cwt. iron in bolts and straps	28 0	0 7 0	
0 1/2 cwt. castings for stuffing-boxes	20 0	0 5 0	
18 cwt. cast-iron in segments, lined	8 0	7 4 0	
0 1/2 cwt. bolts and nuts to ditto, lined	28 0	0 14 0	
	£15 9 11		
Contingencies	—	2 10 1	
Amount of estimate	—	£18 0 0	

SCHEME NO. 5.—FIG. 7.			
	s. d.	£ s. d.	
13 yards cube excavation	6 0	3 18 0	
4 " " cement concrete	18 0	3 12 0	
0 1/2 " " lime	15 0	0 7 6	
5 " " super. 5in. wood paving	15 0	3 15 0	
7 " " boarding to concrete and centring	1 6	0 10 6	
1 " " lineal 12in. sewer	—	0 4 0	
1 " " 6in. connections, including excavating	—	0 5 0	
0 1/2 " " 3in. pipes for water, &c.	—	0 0 6	
2 " " 38in. gas and water mains	13 0	1 6 0	
3 " " 4in.	1 0	0 3 0	
1 " " 5in. hydraulic main	—	0 2 0	
4 " " 4in. channels for wires	0 9	0 3 0	
2 " " 9in. plate slabs to do.	0 3	0 0 6	
1 " " 24in. tramway	—	0 2 9	
14cwt. wrought iron and steel in straps and buckle-plates	15 0	10 10 0	
	£24 19 9		
Contingencies	—	5 0 3	
Amount of estimate	—	£30 0 0	

SCHEME NO. 6.—FIGS. 9 AND 10.			
	s. d.	£ s. d.	
40 yards cube excavation	7 0	14 0 0	
13 " " cement concrete	18 0	11 14 0	
4 " " ballast and sand	6 0	1 4 0	
8 " " super. wood-block flooring, less cr.	12 6	5 0 0	
12 " " boarding to concrete	1 6	0 18 0	
1 " " 2in. plankings	—	0 4 0	
1 " " 1in.	—	0 2 3	
1 " " lineal 15in. sewer	—	0 6 4	
1 " " 4in. iron siphon	—	0 1 0	
1 " " 27in. gas main	—	0 9 0	
1 " " 21in. water main	—	0 5 8	
2 " " 6in. water and gas mains	1 6	0 3 0	
4 " " 4in. channels for wires	0 9	0 3 0	
2 " " 56in. tramway	15 6	1 11 0	
9cwt. steel in joists	9 0	4 1 0	
25lb. wrought-iron in straps and bolts	3 0	0 7 0	
	£10 9 3		
Contingencies	—	7 10 9	
Amount of estimate	—	£18 0 0	
52ft. cube timber to carriageway, use, and labour	1 3	3 5 0	
40 yards cube extra on excavation	1 0	2 0 0	
Extra for hanging up pipes	—	2 15 0	
	£56 0 0		

SCHEME NO. 7.—FIG. 11.			
	s. d.	£ s. d.	
21 yards cube excavation	7 0	7 7 0	
8 " " cement concrete	18 0	7 4 0	
1 1/2 " " ballast and sand	6 0	0 9 0	
5 " " super. wood-block flooring, less cr.	12 6	3 2 6	
5 " " boarding to concrete	1 6	0 7 6	
1 " " 2in. plankings	—	0 4 0	
1 " " 1in.	—	0 2 3	
1 " " lineal 21in. water main	—	0 5 8	
2 " " 6in.	1 6	0 3 0	
4 " " 4in. channel frames	0 9	0 3 0	
1 " " 56in. tramway	—	0 15 6	
4cwt. steel in joists	9 0	2 0 6	
1 1/2lb. wrought iron in straps and bolts	0 3	0 3 0	
	£32 6 11		
Contingencies	—	3 3 1	
Amount of estimate	—	£35 10 0	

[NOTE.—In this estimate it is assumed that the right half of the subway is like the left, and not as on the plan.]

21 yards cube extra on excavation	1 0	1 1 0
36 feet " use and labour on timber for carriageway	1 3	2 5 0
Extra for hanging up pipes	—	1 4 0
	£33 0	

SCHEME NO. 8.—FIG. 12.			
	s. d.	£ s. d.	
20 1/2 yards cube excavation	7 0	7 3 6	
7 1/2 " " cement concrete	18 0	6 10 6	
1 1/2 " " ballast	6 0	0 9 0	
5 " " super. wood-block flooring, less cr.	12 6	3 2 6	
2 " " boarding to concrete	1 6	0 3 0	
1 " " 2in. plankings	—	0 4 0	
1 " " 1in.	—	0 2 3	
1 " " lineal 21in. water main	—	0 5 8	
2 " " 6in.	1 6	0 3 0	
4 " " 4in. channels for wire	0 9	0 3 0	
1 " " 56in. tramways	—	0 15 6	
10 cwt. steel in 3in. flooring	15 0	7 10 0	
14lb. wrought iron in straps and bolts	0 3	0 3 6	
	£16 15 5		
Contingencies	—	5 4 7	
Amount of estimate	—	£32 0 0	

[NOTE.—In this estimate it is assumed that, with the exception of the upper flooring, this subway is exactly like that shown in Fig. 11, and that the width is the same.]

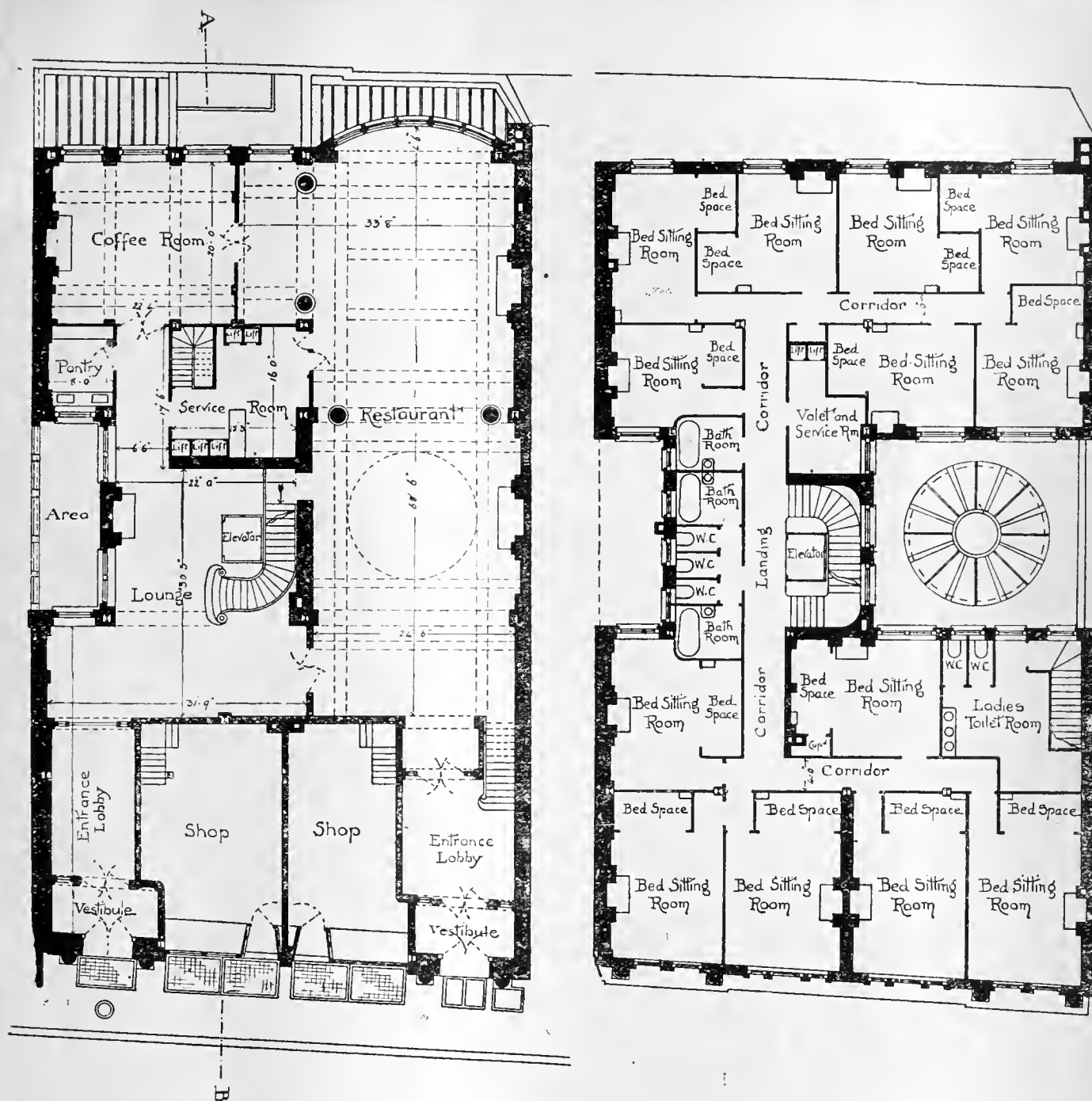
20 1/2 yards cube extra on excavation	1 0	1 0 6
Extra for hanging up pipes and night-work in removing metal	—	1 19 6
	£35 0 0	

CONCLUSION.

The writer has described eight schemes, and given a careful estimate of the cost of each, and it is natural that his views as to which is the best of these should form the ending to this paper. Further consideration has, however, only confirmed the views he expressed in the preface—viz., that no general rules can be given. It is true that, all else being equal, scheme 3, Fig. 5, gives a better result for the money than schemes 1 and 4, Figs. 1 and 6, and that No. 2, Figs. 3 and 4 is, on the same premises, the best system, if the sewers are not to be dealt with. Schemes 6, 7, and 8, Figs. 8 to 11, cannot be compared with the rest as to cost. No 7, Fig. 11, provides far more for the money than any of the others, the slight inconvenience caused by the up and down tramlines being put in different streets being compensated for by the saving in expense. The supplementary estimates to the last three schemes are so put that these estimates may be on equal terms with the others. A celebrated artist once explained that his success as a painter arose from his following the rule "First know what you want to do, and then do it." So here, before anything can be done, it is necessary for careful plans to be made to show what is wanted.

REINFORCED CONCRETE CHIMNEYS.

CONCRETE and steel have been employed of recent years in the construction of lofty chimney-stacks, instead of masonry, and with decided advantages, as being more rigid, taking up less room, and saving costly materials and scaffolding. One of these built for a new power station for the Pacific Electric Railway Company at Los Angeles, Cal., last year, is noticeable for the combined use of these materials, and for the economy of its construction, the particulars of which we gave some time ago. The chimney was 180ft. in height above the base, and its exterior diameter above the base is 15ft. 2in., and the inner diameter 11ft. The base up to shoulder from the footings is 51ft. in height. The shaft consists of two concentric walls, separated by an air space or cavity of 11in. to 16in., increasing towards the top. The outer shell above the shoulder is 9in., 6in., and 5in. thick respectively up to cap in



GROUND FLOOR PLAN

FIRST FLOOR PLAN

WATERLOO RESIDENTIAL HOTEL, JERMYN STREET, W.

sections of equal height, and the inner shell is 5in., 4½in., and 4in. respectively in corresponding sections of height. The Ransome system of construction was adopted with cold twisted steel bars in each shell. There are also rings of steel bars at intervals, and in the outer and inner shells every 18in. apart or more, with vertical bars about 1ft. apart in the lower third of the stack, and at less frequent intervals in the middle and upper sections of the outer shell. The inner shell has also bars about 3ft. apart, and of smaller section. The cap is also of concrete, moulded as a capital in several hollow blocks, reinforced with expanded metal; these blocks were hoisted into position. This hollow capital is formed with cross partitions, reinforced by twisted steel rods. Many other chimneys of reinforced concrete have been constructed having similar features. In this stack the outer and inner shells are connected by ribs at intervals so that they materially sustain each other. These ribs are placed about 30in. apart, and steady the chimney in case of oscilla-

tion. We are not aware of any similar construction in this country, though concrete is being largely used for the purpose.

WATERLOO HOTEL, JERMYN STREET.

THIS building is about to be erected on the site of a fine old house of historical interest which was added to and used in later years as a hotel, and the purpose of the new building is somewhat similar. The whole of the front is proposed to be stone faced, and Westmoreland slates will be used for the roof. The six upper floors are arranged for bachelors' chambers on a plan combining bed and sitting room, whilst on the ground floor there will be two shops and a large restaurant. Each story of the building is to be set back above the second floor, so as to render the suites light and airy; by this method ample balconies are afforded, forming convenient lounge spaces and a reliable means of escape in the event of fire. The con-

tractors are Messrs. Perry and Co., who will carry out the work under the direction of the architect, Mr. G. D. Martin, of Pall Mall East, S.W.

"BUILDING NEWS" DESIGNING CLUB.

A SOLICITOR'S COUNTRY HOUSE.

WE illustrate the three designs for this subject, which we have chosen as the best out of the ninety-two plans received. Architecturally, we prefer the elevations of the third design; but the plans gave us no choice. Beyond the ordinary requirements and amenities of management of an ordinary middle-class house of moderate size, as specified, the main factor in the plan of this building consists in the location of the business-room considered in reference chiefly to the entrance, and, of course, with regard to the privacy of the other parts of the residence. A solicitor, at times, in the ordinary course of his practice, would have callers at his

house, probably of an evening, and the remainder of the premises should not be too evident to such visitors, and yet at the same time this occasional provision ought to be so contrived as not to spoil the adaptability of the entrance-hall for everyday uses. At the end of this review we reprint the conditions issued for the guidance of competitors.

"Ionic" is first, "Tauqs" second, and "Ghost" third.

The plan chosen for the premier position has an excellent hall for the particular purpose, the bay affording a convenient spot for the client or caller to wait should the solicitor be engaged in his room at the moment, or should it not be exactly desirable for the servant to show the visitor into the study without inquiry. It hardly seems necessary to elaborate this matter, as anyone can grasp the position, though, as a matter of fact, no one else in the competition has quite so nicely realised it as "Ionic." The study itself is a comfortably set-out room. The corridor is well lighted, and would give a sense of size and interest. The staircase is well out of sight. The "nook" out of staircase-hall is not wanted, and a door leading through from the parlour to the garden way would have been very much better. The angle to the drawing-room is itself a doubtful advantage. The fireplace recessed under the stairs, and so throwing all available space into the parlour, appears to us would have been a preferable arrangement. The canted landing is a crude detail upstairs, which might be improved; but the bedrooms are good, with the exception that the dressing-room has no access excepting through the bedroom. The elevations speak for themselves and look suitable. Even if we do speak in this qualified way about them, the design needs no apology in this respect.

"Tauqs" takes his position as second also, mainly on the score of the plan; though it is not so good as the first. The library is located near the entrance; but it is not one of the most convenient apartments, with a draught on to the chimney corner. The hall serves no particular object save to give a door on the private side of the drawing-room. A mere recess would have done that, and the hall-space might have been thrown into the drawing-room, which again could be brought further in. The long through passage is written on diversely "Entrance," "Staircase," and "Servery," all of which designations may be correct; but, all the same, it is a long and somewhat dark passageway. The first floor is rather good, though we should prefer to have seen the w.c. door in both these designs a trifle less in evidence. We need not go into the merits of the elevations; they are not particularly attractive, and we do not put them forward for imitation, but their scheme is all of a piece, and has been well thought out. What is wanted is a greater appreciation of wall space, and the interest which belongs to contrast, avoiding an all-over-the-same effect, and leaving some one feature to emphasise the design. "Tauqs" is not over-elaborate, and is not given to fussy detail, but another time we shall hope he will impart a touch of personality and spirit to his design.

"Ghost," the third design, pleases us by the simplicity and breadth of the exterior of his building, though the chimneys might have been handled with more regard to the desirability of some one dominating portion in the grouping of the composition as a whole, and with this idea we should have been inclined to make more of the stack rising over the dining-room. Perhaps there is hardly sufficient justification for canting the right-hand wing of the building; and the library, as a place for housing books, is not the best shape treated as an octagon. Its position for business purposes is most objectionable between the staircase and the drawing-room. The dining-room is not well planned with all the windows at one end, and no exact place for the sideboard, unless it occupies the long wall facing the fireplace, where space can least be spared. Its door facing the entrance is not a model arrangement. The kitchen wing is neatly isolated, but the window to the kitchen under the eaves is very low down. The best bedroom is large, but the position of the bed at the door end necessitates the light being in front of the users; otherwise, if put facing the fireplace, the occupants must sleep in a draught. The corridor space on this floor, including both stairs as a total superficial area, is in excess proportionately with the rooms provided. There is

too much incongruity between the big bedroom and the small one adjoining. "Eurymedon" gives an old-world look to his house, which is quiet and in good taste. The S.W. end is quaintly picturesque. The plans are too crude and the passages ugly, while the head room in the porch is very low under the stairs, even allowing a step down from vestibule. The library is entered conveniently from this lobby, but the broken divisional wall between the drawing-room and the library is bad. The central corridor is too dark. This design with more study expended on its interior would have been a success. "New Boy" is careless in arranging his elevations and plans on the sheet, so spoiling his chances of illustration. Let all the competitors take a note of this remark. "New Boy" has a sense of picturesqueness, and the detail of front entrance exhibits a taste for good domestic work on old lines. His drawings are lacking in effectiveness. By showing such scraps of roof tiling (a roof never looks thus), a trick is attempted which spoils all appreciation of repose—a quality which the "New Boy" has really rather well obtained in an otherwise unpretentious fashion. His plan is not so good, because there is no recognition of proportion about it. Thus, if one takes the super. of his porch, vestibule, hall, and staircase hall beyond, the area is considerable, and yet planned thus the whole thing is cramped. The silly garden entrance dovetailed thus awkwardly into the two best sitting-rooms spoils the shape of both. The library is fairly handy to the front door; but there is no room for the caller to wait in till he is shown into that apartment. We do not think we need go through the plan further—space precludes; but the w.c. for the servants is too much in evidence next the tradesmen's doorway. "Alpha" wastes room in halls and landings, and has a dark passage in the middle of his house. The inner hall has an ungainly shape. The business room is close to the front door, and the outside hall gives a nice waiting space. The west elevation has the windows so contrived as to destroy the structural strength of the wall. The chimney stacks are ugly, with cornices projecting so excessively, and "Alpha" does not realise the charm of proportion. "An Old Scholar" has not finished his lessons yet. He omits all rainwater pipes, and does not show how he would locate them on the garden front, where there are three gables with a big arch to the entrance, and a window placed in a line with the valley above. The dome over the main entrance is too squat to be seen behind the parapet, while the head of the window below is too high up to allow of a proper gutter, even if the diameter of the dome did not extend too far, as it does, to allow of a proper parapet wall. The hall through the house depends on a borrowed light from the garden way, which is only got at through the best parlours. "Old Scholar" ought to do better. "Yew Tree" adopts half-timber, with neat drawings, careful and business-like; but his roofs are so small and his ground-floor windows are so big. The staircase is in full view of the front door, and to reach the library the hall has to be traversed. Much space is wasted in a landing and upper hall, and there is an ill-contrived dark passage in the centre of things on the ground floor. "Ilex" is a good, quiet draughtsman; but he has a trick of locating the doors to his principal rooms too much in the corners, and without reference to the position of the fireplaces. Thus, in the library, which is correctly enough near the main entrance, the door opens right on to the fireplace, which is almost in full view of the external portal, so that, should the solicitor chance to be warming his toes when some casual client called, the latter would see too much at a glance, and, besides, there is no convenient place for the caller to wait in other than the hall in the middle of the house. There is no object in shutting off the stairs from such a hall. The plan, otherwise, is a fairly good one, though we do not commend the corridors on first floor, and think the landing occupies a lot of space. Externally the design is becoming, but not attractive. "Liver" has more idea of composition, and his entrance-front is nicely grouped and composed, with bay windows at the ends and a row of dormer gables in the centre. The one odd chimney is out of place, but might have been managed in a less timid way, or, better still, omitted, by shifting the bedroom and library fireplaces. As to the hall fireplace, that apartment is so ill-contrived, owing to the cross-passage, that an entirely different arrangement would be desirable. Every visitor going to the business-room would have to pass the parlour doors. "Liver's" other

elevations are very ordinary. "Marksman" gives a cottage-like look to his house, and in some respects he is successful. His plans are among the best sent in, though not compact in their arrangement. The library is near the entrance, but the fireplace is right on to the door of the room. The drawing and dining rooms are square formed and comfortable, but are not artistically contrived; they do avoid the curse of "quaintness," which is a merit. Not so "Cedric," who seeks to find favour by canting off in a somewhat meaningless way his library and entrance porch, only to create a few difficulties which have floored his ambition. The library is odd-shaped and uncomfortable, with a most awkward fireside away from the light and close up to the door which opens right on to it. The seat in the dining-room bay is of the upholsterer's "fitment" type, and not very good at that, with lancet-headed cupboards or screens at the back of the seats. The first floor is compact, and the elevations look wanting in breadth, though not badly drawn.

"Force" was very late, but for once we accept his excuse. If he had spent less time in inking over almost the entire surface of his elevations, they would have been better-looking. He over-joins them, and yet shows the same house in the view with no joints at all, or hardly any, making it look as if it were rough-cast. The staircase is too much in view of the entrance. The dining-room is an ugly shaped one, and we are not charmed with the chamber floor. The loggia does not add to the elegance of the composition.

"Cave Canem," of the Dutch cheese tree and shrub school, curls up the coping of his front gable, Chinese fashion, and puts balls on the inverts of the curve. His plan has merit, however, but the screened off landing is objectless, and the business-room is too mixed up with the parlours. It is not quite an ideal design. "The Magpie" comes here, because he does give a vestibule door to the business-room; but, then, all the same, both the parlour doors are close at hand, only just beyond the open screen. The passage to garden door is ugly, and the drawing-room fireplace is not redeemed by the projecting screen to keep the draught away from the door. The massive archway to porch is spoiled by the quoin supporting the wall above coming in so close, and the proportion of the surrounding gables is ungainly and ill-managed. The style has a casual look about it, the roofing slabs being drawn like random rusticated masonry, with wide joints all round as if there was no lap. "Gayville" would appear to be a man of taste if we judge by some parts of his work; but he is distinctly weak in doorways: the front entrance is very ugly, and the drawing-room garden door, with its Tudor head, is no better—like the waiting-room entrance to a Gothic railway station done by the locomotive engineer. Otherwise the S.E. elevation is well composed and pretty, with the drawing-room bay quietly tucked in by the side of the projecting chimney breast. The plan is open to objections already enumerated in respect to position of the doors to the parlours and business-room. "Orchid" gives a "double-fronted villa" look to the garden elevation of his house, and the gable over the main entrance has a pinched appearance. The hall and passage area is large and devoid of good effect without dignity of contrivance. The business-room is well positioned, but the house seems to have all its thick walling outside and only thin partitions within. "Old Mercer" gives a squarish building with a central hall and good spacious rooms. The business-room is an ideal arrangement, with the fireplace close to the window, though the legal gentleman would have to sit too near the fire to get the full advantage of the window. The big, sprawling oriel outside accounts for this position of the business-room light. The exterior is unattractive, and the angle set porch is paltry. "The Last Man In" concludes the elect set whence the three first designs were chosen. We are not sure he deserves to be so favoured, but the margin line is very fine, and those contributors who come next must not think they are out of the running. With such a heap of plans they cannot be all mentioned at once, and space is inadequate to speak of them all. The business-room in this plan is reached out of a tiny lobby, which also furnishes the only entrance to the drawing-room. The elevations are not good; but on the whole, taking one thing with the other, the author obtains an opportunity for criticism. He has much to learn still.

"Tyne" would have been placed much higher

but he ignored the rules as to size of paper, and so must suffer for it. Another time he will be placed *hors de combat* at once. The garden front is good; but the entrance front porch has a wavy-lined parapet which is paltry. The plans are among the best sent in, and the view is boldly drawn, but not effectively, with the blacked solid trees. The plans are impaired by running the lines like Oxford-frame corners at all the door and window openings. Drop such fakements, "Tyne," in future. "O. B." has merits, which we give him credit for, and he suffers from ineffective draughtsmanship and detail. His house would withstand the four winds of heaven in its granite-like masonry. "The Kid" draws free-hand with a thick, heavy line. His plans are of the "quaint" type, all angles and oddments, with occasional seats all about for people to squat on as they go to and fro. "Lyric" has a better set of elevations than plans, but they are made to read two ways on the sheet. "Vectis" draws with horizontal lines only, so that the building has the appearance of being weather-boarded. The contrivance of his plan looks cramped, and the entrance certainly is so. "Blackheart" comes next. Good hall, wasteful landing. Neat drawing, but shows ordinary stone sort of building. "Pip" tries to get distinction in his garden front; but it lacks the repose so desirable in domestic work, and the end elevation is over-windowed. The plan, as a house, has good parts, but the business-room is forgotten by placing it on the far side of the hall from the main entry. "St. Nicholas" gives shaped gables to a closely-schemed plan, well contrived, with economy and skill in detail of arrangement. The bath-room is too much separated from the bedrooms, but the w.c. is neatly screened. The elevations are wanting in architectural idea. "Novocastria" sends a good, well-arranged sheet, including a view. The blunt apex gables are not attractive; but the plan has merit—such as the screening of the hall from the porch, and the library is handy, though its door is in the wrong corner. The first floor is a practical arrangement, rather devoid of charm which only comes of architectural planning. "Loides" deserves about the same degree of approval; and what is more, he draws carefully, though with absence of personality of touch. His mean-looking chimney-stacks are poor things. "Jingo" is exceedingly neat, and his elevations, particularly that towards the south, rank as rather good and well composed; indeed, the house would look suitable and good. The garden door is neatly managed 'twixt the two parlour bays. We would advise "Jingo" to draw with a bolder line, and to continue taking pains. The mullions of windows should be blacked-in on the plans. "Puck" has a poor plan, and we cannot find room to point out its defects in detail; but if he were not as good as he is, his name would be only mentioned. The arched opening to drawing-room from the terrace looks like a stable archway on the south front. "Adze" has a well-balanced scheme, with a fair degree of thought expended, which always repays the worker. Let him read what is said about others, and take the hints to himself. He is workmanlike, and if willing to learn will improve. "Marcus" is unequal, and should study some good men's work, architecturally considered. The curved porch is too clever to be convenient. "Kangaroo" is rather odd, but has seized the general idea of Georgian simplicity in a way which could be developed skillfully;—only let him, pray, omit battered chimney-shafts from the ground upwards. The entry to the drawing-room is more suited to the front door, and in itself would be pretty if well detailed. The staircase hall is ugly and rise to stairs awkward, impinging upon the passageway. "Pan" has a circular turret with stairs out of servants' hall, as if that room served as an entrance hall. The plans are compact. "Digniori" draws in outline and gives patterned gables, which are open to improvement in shape. "Tryfan" does not show the entrance front. The others are ordinary, but inoffensive. "Mr. Deoley" has a fancy for fun, and in the drawing-room is a niche for his bust to balance the importance of the angle-set fireplace opposite. The plan is not half a bad one, though we think there is too much fancy outside. The saddle-backed belvedere between the chimneys has two balconies—one to the N.E. and one to the S.W. "Knight" is commonplace, and his entrance portal seems a variation of something which we have seen before. "Sam" slopes with a battering wall the ends of his house, and draws as if he wanted to erect a ruin. The

whole thing seems disjointed. The kitchen looks like a passage: it is so long as compared with its width, and the pantry is bigger than the "kitchen." The entrance hall is said to be for dancing. "Sau" ought to do something better than this another time. "Plumb-bob" has a fairly good plan, but the stairway is too much in evidence from the porch. The long slope over the hall is out of keeping with the style of house. The loggia of "Leo's" house is the best part about it, but he does take trouble, but he wastes room in his passages shockingly, and they are very dark, too. "Six and Eightpence" is a capital draughtsman, and his N. elevation approaches a success; but we do not like the octagonal tower to drawing-room angle of the house. The separate entry to the office is ingenious, but not so good as the first plans.

"D'Artagnan" plods on and seems improving. We wish he would throw a little "go" into his patient work. "A Scot" gives us a clients' door, but we do not want our clients knocking at our study door, or Christmas carol singers shouting, "All seated on the ground" under our very noses as they could here. The entrance has a very pointed Gothic lancet arch. "Friar Tuck" is not domestic looking enough, and his central corridor rambles about all over the building. The kitchen has two canted corners with a door in each.

"Imprimatur" has a plain sort of house which we should not object to if he would only invest it with a little grace. It has a scattered plan. "Zig Zag" is old-fashioned, and clutters up his building without any idea of the value of wall space, and the plan is spoiled by the incongruous shape of the hall. "Frena" provides a big tower to supply a belvedere, and the effect is broad and old-world-like, as shown by the sketch. The plans are neat; but the first floor landing, 20ft. by 10ft. 6in., is very wasteful. The parlours are spacious, the library being in the wrong place. "Consul" adopts the silly trick of blacking in solid every other tile of the paving. "Vulcan" ought to go up higher. He gives an extra door to the business-room; but that makes it too much a convenience for any beggar-man to call at all hours. The loggia is costly and pretentious. "Criss Cross" has a bad sprawling plan and ugly elevation; but he shows individuality, and hope something more worthy of the effort may come of it another time. "Frouge" does not excite our interest; but we think he might do better. "Val" is in the same unsatisfactory stage. We want to encourage him, for he is certainly industrious, though he draws on the wrong-sized paper—see new rules. "Bucolic" ends the second class of designs with very careful work, and a well-balanced façade.

The remainder of the plans come in the following order:—"Marquis," "Norseman," "Seasider," "Bill," "Cleddadyn," "Arabintang," "Kingston," "Jap," "Lavernock," "Dingle," "Wee Mac Greggor," "Obelisk," "Shine," "Primus," "Leofric," "Cast," "Pen," "Try," "Tenderfoot," "Vale O'Lune" (pay your postage another time, threepence excess paid), "Regent," "Nick," "Jacobean" (Hanley), "Legal" (it is contrary to rules to shade in colour), "Autocar," "Spero," "Architect," "Wee MacGreggor," (*sic*) Galashiels, "Sauvey," "Opportunities," "Quatre Vois," "Inside Right," "Croesus," "Tee Square," "Jacobean" (Halifax), and "Omega," also "Jenny Wren," in pencil, and a week late, otherwise this last proposal would have stood much higher.

The following were the conditions:—B.—A Solicitor's Country House in stone, with stone slab slated roof, on a level site, surrounded by trees. The reception-rooms should face the south and south-east, with the principal entrance on the N.W. side of the house. The gardens are on the south side, below a terraced lawn. The accommodation is to be mainly on the ground and first floors, two servants' bedrooms and a boxroom on the second floor. No objection would be taken to a belvedere, lead-covered turret and flat; but this feature is optional. The dining-room is to be 25ft. by 15ft., exclusive of a bay, if any is provided; drawing-room is to be 18ft. by 15ft., and the library 15ft. by 12ft., located conveniently for use as a business-room. There must be a good roomy panelled entrance hall, say 10ft. square, with a 4ft.-wide oak staircase beyond the hall and out of sight of the entrance to the house. The kitchen offices to be of a suitable kind, including a butler's pantry and housekeeper's

little room fitted with store cupboards so placed as to be available for the use of the mistress also. A cloakroom and w.c. are required on the ground floor for gentlemen. Five bedrooms on the first floor, a w.c., h.m.c., and a bathroom. The cost of the house to be reckoned at 9d. per foot cube to limit of £2,200. A cycle-house is not wanted, as a motor-house and stable will be built detached from the house, and need not be shown. Windows to be mullioned and lead glazed. The style based upon Tudor or Jacobean work is to be adapted to modern requirements in a simple and broad way with gables. The ground-floor rooms to be 9ft. 10in. high, and the first-floor rooms 9ft. high. Scale to be 5ft. to the inch; two elevations, one section, and three plans. Drawings to reach the BUILDING NEWS Office not later than Nov. 30.

CHIPS.

The Board of Trade inspection of the new Tanat Valley light railway will take place to-day (Friday).

The members of Hull City Council have decided to proceed with a portion of the town-hall extension scheme at a cost of £53,000.

The Bristol Libraries Committee are about to commence operations with the new central and reference library in Deanery-road. The building will be erected in accordance with plans prepared by Mr. H. Percy Adams, F.R.I.B.A., Woburn-place, W. Messrs. Willcock and Co., of Wolverhampton, are the contractors, and the cost will be about £30,000.

In the centre of the village of Bitterley, Salop, a drinking fountain of Gunhill stone has been erected as a Coronation memorial. Mr. Charles J. Watkins, of Corve-street, Ludlow, carried out the work.

An adjourned meeting of the heritors of New Monkland N.B., has been held at Airdrie to consider the report of a committee on the repair of the church. The committee had got an estimate for the work as shown in the plan by the architect, and the lowest offers amounted in all to £1,981. This was for reseating the church, making structural alterations in the east gable, heating the church, and re-erecting the gallery. The meeting decided by a majority to contribute £1,500 of the cost, on condition that the seatholders and congregation raise the balance.

An anonymous donor has placed the sum of £2,000 at the disposal of the curate of Claygate, Surrey, for the renovation and decoration of Holy Trinity Church, Claygate.

The parishioners of Holy Trinity, Ripon, have sanctioned the seeking of a faculty to remove the south transept gallery, and to make certain additions to the seating of the floor. The north transept gallery was removed in 1899.

The building committee of the Llandaff Town Council have resolved upon spending £2,000 in widening roads and building new bridges in the parishes of Peterston, Pendoylan, Caerau, Lavernock, and Dinns Pows.

Mr. W. A. Ducat, an inspector of the Local Government Board, held an inquiry at Meole, Shrewsbury, recently, in respect of an application of the Atcham Rural District Council for sanction to borrow £3,500 to carry out a water scheme for the parish of Meole and a portion of the parish of Condover. The scheme provided for the building of a reservoir at Lythwood for the storing of water from the Wellbach and Whitty springs, and will remove the present necessity on supplying Meole from a colliery.

Four acres have been added to the new cemetery at Jesmond, by the All Saints Burial Board, two-thirds of which were consecrated by the Bishop of Newcastle last week. The ground has been laid out and inclosed from plans by Mr. Parker Brewis, architect.

Apart from one or two suburban estates, there was a general diminution in the volume and activity of business at the Tokenhouse-yard Mart last week. The principal item was the sale of freehold ground-rents of £519 per annum, secured upon 117 houses and shops in Wandsworth and Holloway, with reversions in 63 to 82 years, which realised £20,718. Another estate of 37 houses and shops in Putney, Pimlico, &c., brought in a total of £11,170. The total for the week was £72,105.

At the Westminster Roman Catholic Cathedral, on Wednesday, the great cross which will hang over the chancel was placed in position. The cross, which was blessed by Provost Johnson on Sunday morning, measures 30ft. by 22ft. It is gilded and has been built abroad of teak and mahogany. The figure of Christ, painted on canvas by Mr. C. Symons, is stretched on the front of the cross, while the figures of the Four Evangelists are placed at the angles. On the back is a representation of the Virgin Mary.

OBITUARY.

MR. WILLIAM WARLOW GWYTHYR, F.R.I.B.A., died on Thursday in last week at 9, Clifton-hill, N.W., aged 73. Mr. Gwyther, who had been a Fellow of the Institute since 1880, had practised for many years at 26, Bedford-row, W.C. The funeral service was held at All Saints' Church, Finchley-road, on Tuesday, at noon.

CHIPS.

At St. Paul's Cathedral on Wednesday the unveiling and dedication took place of a marble panel to the memory of Sir John Stainer. The memorial, which is the work of Mr. H. Pegram, has been set in the wall of the north transept. On the upper portion of the panel is a carved representation of a vision of Christ. A worshipper kneels with outstretched arms before an altar, and, in the midst of the smoke arising from the offering, Christ sits enthroned, surrounded by cherubs. In front of the altar are the words, "I saw the Lord." On the lower portion of the panel is a sculptured portrait of Sir John Stainer, set in a wreath of laurels, and beneath it is the following inscription:—"In memory of Sir John Stainer, Art.Mag., Mus.Doc., Organist of this Cathedral, 1872-1888."

The donor of the site on Denmark Hill for the new buildings of King's College Hospital is the Hon. W. F. D. Smith, who is the Chairman of the Removal Committee and Treasurer of King's College.

A scaffolding accident occurred at the Central Railway Station, Glasgow, on Wednesday, resulting in the death of one and the serious injury of three men. The accident took place at the extensions at present under construction on the south side of Argyll-street, and immediately over Ann-street. Much of the girder work of the new station has already been put into position, and a large number of riveters are employed in carrying through the operations. A platform erected at a height of 50ft. on the girder work collapsed, and four persons employed on it were thrown to the platform level.

The roof of the Roman Catholic chapel at Wellington (Salop) suddenly collapsed on Wednesday morning. A stained-glass window, several oil paintings, and the mission cross were destroyed. The damage is estimated at £3,000.

At St. Michael's Church, Minehead, Somerset, a stained-glass east window and a Bible desk were dedicated as memorials last week. The window is the work of Mr. Henry Holiday. The four principal lights relate events in the life of our Lord before and after the Crucifixion. The three upper divisions of the window exhibit the nine orders of angels. The Bible desk is the work of Mr. Nelson Dawson, and is of wrought iron, brass, and oak. The centre figure is of St. John the Baptist showing the label "Ecce Agnus Dei." Figures of angels at the sides, each under a small crocketed canopy, complete the design.

St. Paul's Church, Dorking, which has just been restored and renovated at a cost of £1,600, was reopened on Tuesday in the presence of the Bishop of Winchester.

The House Committee and Committee of Treasurer and Almoners have unanimously recommended the Governors of St. Bartholomew's Hospital to take steps to ascertain the possibility of acquiring further additions to the site. This course is approved by the medical and surgical staff. The acquisition of more land will necessitate the reconsideration of all previous plans for wards and other new buildings. With reference to this scheme for reconstruction, the *City Press* states that the possible competition of the Post Office for the additional land required has been disposed of by the decision of the Corporation to persevere with the construction of a proposed thoroughfare through the estate. The buildings to be erected on the north side of the new street will not interfere with the land needed for the hospital.

The City Court of Common Council have received a report from their museum committee announcing that, under the bequest of the late Mr. George Gilbert, the brother of the late Sir John Gilbert, R.A., twelve oil paintings and 81 water-colour drawings by the latter distinguished artist will be added to the collection of his works in the Guildhall Art Gallery. The new pictures, which include several landscapes and some historical scenes, have been hung this week.

Mr. E. A. Sandford Fawcett, M.I.C.E., L.G.B. inspector, conducted an inquiry at the Clubroom, Chudleigh Knighton, on Friday, into the application of the Newton Rural Council for sanction to borrow £330 for the execution of works for supplying Chudleigh Knighton with water.

At the meeting of the managers of the Metropolitan Asylum District held on Saturday, a letter was read from the Local Government Board authorising the execution of alterations and additions to the Fountain Hospital, at a cost of £15,000.

Building Intelligence.

BIRMINGHAM.—The church of St. Luke the Evangelist, Bristol-street, Birmingham, has been reopened for public worship after rebuilding. More than four years ago the church that had stood on the site since 1841 was found to be in a dangerous condition, it having been built of soft local sandstone, and on an insecure foundation. The city surveyor ordered the demolition of the building, and from that day the services were held in a neighbouring building that had been built for a mews, and had been used as a music-hall. As far as funds have permitted, the designs of Messrs. Mansell and Mansell have been carried out by Messrs. John Barnsley and Sons. The new church is larger than the old one, and has seating accommodation for about 800 worshippers. It is 135ft. long and 80ft. wide, consisting of chancel, nave, and transepts. The Perpendicular style has been adopted, and to increase the apparent length of the edifice the usual chancel arch has been dispensed with. The roof of the nave is supported on slender arches. Beneath the organ loft are three vestries, and a room for parochial meetings is provided under the chancel. The schools are also connected with the church. Hollington stone has been used for the building, and the woodwork is of oak. A lofty square tower, with pinnacles, is to be added, with a clock and eight bells. The brass of the old foundation-stone, laid by Bishop Pepys, has been affixed to the wall of the south-west porch. It records the names of the architect, Mr. Harvey Edgington, and the builder, Mr. George Horten, of the former church.

BRISTOL.—The new pulpit in course of erection in the nave of Bristol Cathedral will be inaugurated on Christmas Day by a sermon to be preached from it by the Dean. The pulpit has a body octagonal in plan, with carved scenes in Christ's life occupying five of the panels. It is supported on a centre column surrounded by smaller shafts, and access to it is by a carved stone staircase. In style it is of English Gothic of the end of the 14th century, though original in its design. The materials are white Beere stone, and Rosso marble for the detached columns and plinth. The scenes represented in the five sculptured panels referred to are the Nativity, the Baptism, the Crucifixion, the Resurrection, and the Ascension. The pulpit stands backed by one of the large piers, and commands the cathedral well. It is moulded, and has carved ornamentation and details. It is the gift of Mrs. Colman, of Bristol, and is in memory of her late husband. It was designed by Mr. G. F. Bodley, R.A., of Gray's Inn, and its execution was intrusted to Mr. Turner, of London.

BURY, LANC.—The new buildings of Bury Grammar School, which were opened yesterday (Thursday) by the Earl of Derby, form a valuable addition to the places of secondary education in the county, and supply, by their equipment, the needs of the populous area which has its centre in Bury. The architect is Mr. W. Venn Gough, of Bristol. The buildings comprise only part of the whole design which the Governors of the school hope in due course to carry out. This shows a complete quadrangle, embracing separate schools for the respective accommodation of 350 boys and 200 girls; but at present only two sides and a half of the quadrangle have been erected. The cubic contents of the contemplated schools were stated at 877,456ft., and the estimated cost was put at £19,280. In the centre of the quadrangle there is ultimately to be a large assembly-hall, capable of seating about 600 persons.

CROPTHORNE.—Mr. Drinkwater Butt, F.R.P.S., of Gower-street and Kensington, has just completed designs and accepted the tender of Mr. A. Cliff, of Eveham, for additions and alterations at The Den, Crowthorne, Wiltshire, the residence of Mr. A. H. Avery, a partner in the well-known firm of scale-makers of Birmingham. This picturesque country house, overlooking the valley of the Avon, was originally a group of cottages of the half-timber period characteristic of the neighbourhood, and was converted into a single house by the late Sir Lawson Tait, the eminent surgeon. Since the property came into the hands of Mr. Avery it has been further improved under the direction of Mr. Edwin Lutyna and Mr. Drinkwater Butt, the former designing the quaint-sunk garden, and the latter restoring the old-style leading of the windows, and being now responsible for the additions, new gables,

&c. Great care has been taken in the preservation of the old work, and in making the new to thoroughly harmonise with it.

ILFRACOMBE.—The new church of St. Peter, in Highfield-road, which has been built from the designs of Mr. G. H. Fellowes Prynne, was consecrated on Thursday in last week by Dr. Robertson, Lord Bishop of the Diocese. The church is not by any means completed, the chapel, clergy vestry, west port entrance, and tower having at present been delayed owing to the want of funds. The portion completed consists of the sanctuary, chancel, choir vestry, organ-chamber, nave, north and south aisle, north and south transepts, base of the tower, and the heating-chamber, which have occupied seventy weeks to complete. The late Mr. F. W. J. Rees, of Chelmsford, Essex, presented the church with an organ, valued at £1,200. The church is in the style of the Late Decorated. When completed it is intended to accommodate 610 persons, besides 40 for the choir. So far about £6,500 has been spent. To complete the church another £1,500 will be required.

LEEDS.—The new branch library at Holbeck was recently opened. The building has been erected under the superintendence of the architect, Mr. William Bakewell, F.R.I.B.A., of Leeds, whose design was selected by the assessor, Mr. Leonard Stokes, F.R.I.B.A., from those submitted in competition. The exterior is faced with Accrington bricks and dressings of terracotta, the roofs are slated with green Westmoreland slates, and the building generally is of fireproof construction. The whole of the floors are laid in wood blocks and marble mosaic, and the walls of the public rooms are lined with a dado of glazed tiles. The accommodation provided consists, on the ground floor, of large reading-room, lending library, ladies' room, and librarian's room. The juveniles' room is situated on the lower ground floor, together with the usual offices, &c. The fittings generally have been arranged on lines laid down by the chief librarian, and are executed in teak and oak. The building has been erected by Messrs. Armitage and Hodgson, contractors, Leeds. The fittings and cabinet work have been carried out by Messrs. Goodall, Lamb, and Heighway, Ltd., of Manchester. Mr. H. Jones acted as clerk of the works.

SCHIVAS HOUSE, TARVES, N.B.—The Earl of Aberdeen has had restored, as a residence for his eldest son, Lord Haddo, the old House of Schivas, in the parish of Tarves. It was built about 1640 by a descendant from a younger branch of the noble family of Kinfauns. Some considerable time after the lands of Schivas became the property of a scion of the Forbeses of Craigievar, and at the beginning of last century they were bought by Mr. Forbes Irvine of Drum, who sold them to the then Earl of Aberdeen in 1845. A few years ago the mansion house, then in a state of comparative ruin, was destroyed by fire, leaving nothing but the stone walls, which are of great thickness and strength. In the restoration, which has been carried out by Mr. Cobban, architect, Haddo House, all the old features of the original building have been retained, and the house is now restored as it was nearly three hundred years ago.

The town council of Cupar-Fife have under consideration the question of draining the Burgh, and treating the sewage by means of the septic tank system, Mr. Henry Bruce, C.E., of Cupar, is preparing the scheme, for which Messrs. Cameron, Commin, and Martin, of 1, Victoria-street, Westminster, S.W., are acting as consulting engineers.

Harry Sleeman, a clerk of works, employed by Messrs. Jay's, Regent-street, and living in Flanders-road, Bedford Park, was on Saturday, at Marlborough-street Police-court, remanded, charged with defrauding his employers of £148, by means of falsifying accounts under his care between Dec. 24, 1902, and Dec. 10, 1903. The alleged fraud was discovered when the books were investigated while the accused was temporarily absent through illness.

As a result of the removal of the Brett Memorial in Malling Church, a 13th-century window hitherto concealed by brickwork was opened out. The Brett memorial was erected in 1620 in the south wall of the chancel. In 1870 the whole church, with the exception of the chancel, was pulled down, being considered unsafe, and rebuilt. It was evidently intended originally to include the chancel in the scheme of demolition, but this was happily averted by a special resolution. In 1901 the whole nave was rebuilt. The window has remained open during this week, but very shortly the replacing of the memorial must cover it again.

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ILLUSTRATIONS.

INDEMNITY MUTUAL MARINE INSURANCE OFFICES, OLD BROAD STREET, E.C.—WATERLOO HOTEL, JERMYN STREET, W.—NATIONAL SILVER MEDAL DESIGNS FOR POTTERY PANELS.—"AVOCA," PRENTON.—DESIGNS FOR A SOLICITOR'S COUNTRY HOUSE.—THE BELL INN, MARTLESHAM.

Our Illustrations.

INDEMNITY MUTUAL MARINE INSURANCE CO.'S OFFICES, 1, OLD BROAD STREET.

THIS new building, which is being erected at the junction of Old Broad-street and Threadneedle-street, occupies the site of a building formerly the property of the Imperial Fire and Life Insurance Company. Upon the amalgamation of this company with the Allied Assurance Company, Limited, the Imperial Office was removed to Bartholomew-lane, and the site of the old office sold to the Indemnity Mutual Marine Insurance Company, Limited, who are erecting the new building. The former building was of good classic proportions, and was designed by Mr. Thomas Gibson, who also designed the National Provincial Bank of England, close by. The building, however, was unsuited for modern requirements, both as regards height and lighting area, and had to be removed. The new building, the design of which is published to-day, contains six floors of offices, with an additional basement over part of the site, containing strong-rooms and heating-chambers, &c. The principal entrance is from Old Broad-street, but a subsidiary entrance leads into Threadneedle-street. The main entrance leads directly to a lift, which serves the whole premises. The various floors are designed without columns or obstructions of any kind, so as to be easily divisible into suites of offices. On the lower ground floor suites of lavatories are arranged, special provision being made for principals and managers while in the building. The façades are being erected in Portland stone throughout, all interior areas being lined with white glazed bricks, and the entrance and staircase are to be lined with marble and faience linings throughout. The whole of the floors are of fireproof construction, and the floors of the corridors are to be laid with mosaic paving. The works are being carried out by Messrs. Colls and Sons, of Coleman-street, from designs and under the personal superintendence of Mr. H. Chatfield Clarke, of Bishopsgate-street Within. Mr. W. Crossley is acting as clerk of works.

WATERLOO HOTEL, JERMYN STREET.

(For description, and plans of ground and first floors, see page 823.)

NATIONAL SILVER MEDAL DESIGNS FOR POTTERY PANELS TO A FIREPLACE.

THESE panels illustrate "Recreation" in the form of "Literature or Reading and Music." In the centre panel a group of maidens are listening to some passages of a romance read by the fair authoress herself. The folio from which she is reading is held by a little slave boy, whose pre-occupation contrasts with the eager enthusiasm of the other bearers. The figures emblematic of Music in the two side panels have ceased play-

ing, and are also listening to the story. The colour scheme is carried out in rich greens, blues, purples, and creamy whites, lighted with splashes of orange amongst the trees. A somewhat complicated, though very interesting, process is employed. The body of the panels is a rich terracotta clay, upon which, whilst wet, or, to use a technical term, whilst in the "green" state, the whole of the design is painted in coloured clay washes called "slips." This slip is then removed on the outlines until the terracotta body shows through. The panels are then placed in the oven and fired, coming out in what is known as the "Biscuit" state. Details, such as the patterns on draperies, &c., are then added in underglaze colour, and the whole is dipped in a toned transparent glaze. They now go through the gloat-oven fire, and are ready for use. This method, which is really a combination of several processes used in a distinctly individual way, results in peculiarly fine colour effects, and is especially adapted to interior decoration. In this case the panels form the centre of a scheme for the decoration of a fireplace of walnut wood, the luscious glaze effect being echoed by the glass in the doors of a little cupboard above. We propose to illustrate a view of the fireplace shortly from the author's sketch. A silver medal was this year awarded for the design to Mr. Herbert Ashwin Budd, of Fulham.

"AVOCA," PRENTON.

THIS country house was designed by the late Mr. J. J. Talbot, of Liverpool, who lent us the drawings shortly before his recent decease. The plans show the arrangement of the building, which has three reception rooms and six bedrooms, a feature, for the sake of the view, being made of a canted alcove in the drawing-room, rather well managed. The main walls are rough-cast.

"BUILDING NEWS" DESIGNING CLUB: A SOLICITOR'S COUNTRY HOUSE.

(For description and awards see page 823.)

THE BELL INN, MARTLESHAM.

THIS sketch shows an old Suffolk example of domestic work known as the Bell Inn at Martlesham. It is chiefly remarkable by reason of the ancient framing of the hoist projecting over the street and attached to the inn. This gangway originally communicated with a malting or store to the rear of the premises. There is not much to be said about the building, though its upper stage is in half-timber. Without any pretensions, and having seen its best days, the old house is well in keeping with its surroundings, helping to add to the quaintness of a rural street in a picturesque village.

Mr. Silvanus Trevail, of 80, Lemou-street, Truro, and of 13, Sherborne-lane, E.C., ex-president of the Society of Architects, F.R.I.B.A., who died at Bodmin on Nov. 7 last, has left estate which has been valued at £6,908 15s. 10 1/2d. gross, and at £4,401 5s. 1d. net, by his sister, Mrs. Laura Rundle, of Trevollard, Lanreath, wife of Mr. Richard Rundle, the sole executrix of his will.

The construction of a new Congregational church has been begun at Lynton, North Devon, the whole cost of which is to be defrayed by Sir George Newnes, M.P. The new church is to take the place of a building which was erected in 1850, and which had accommodation for only 250 persons.

Mr. A. D. Price, M.Inst.C.E., engineering inspector of the Local Government Board for Ireland, has held an inquiry in the town-hall, Dundalk, into the application made by the Dundalk Urban District Council to the Local Government Board for their sanction to loans of £5,000 and £500, for the purpose of erecting working-class lodging-houses under the Housing of the Working Classes Act, and defraying the extra expenditure incurred in the carrying out of alterations at the town-hall respectively.

At the last meeting of the Folkestone Chamber of Commerce Mr. W. White presented elaborate plans for the proposed winter gardens on the sea-front, at an estimated cost of £30,000. The whole scheme is to be brought before the town council at an early date.

The city council of Bristol authorised their sanitary and improvement committee to obtain sanction for a loan of £11,500 to cover the expenses incurred in compensating owners of land acquired for the purpose of widening some 40 thoroughfares in the city.

The town council of Warrington have been authorised to borrow £21,396 for street improvements, and £12,296 for the purposes of private street works.

COMPETITIONS.

OLDHAM.—The new Board schools competition at Oldham has been settled. The assessor (whose name is not stated) awarded the first place to Messrs. Henry Cheers, of Twickenham, London, and Smith, of Blackburn, joint architects, and second place to those sent in by Messrs. Woodhouse and Willoughby, of Manchester. The drawings have been on view this week. The arrangement was for 1,200 on the ground floor, 400 senior and 400 junior in one mixed school, and 400 infants. The site is almost square, but falls about 25ft., and one corner of the land is almost 3ft. above the level of the other, while diagonally the levels vary even more, about 14ft. one way and 11ft. the other. The successful plan doubtless has hit on a scheme to meet the difficult question of the levels, as the mixed school for 800 with a central hall would be over 200ft. long. We hope soon to illustrate the accepted design, which has been promised us by the architect's.

ROCHDALE.—Competitive plans for the erection of the new elementary school at Greenbank were recently sent in to the Education Committee of the Rochdale Corporation. The plans of Messrs. Butterworth and Duncan, architects, of Rochdale, have been recommended for adoption.

TAMWORTH.—There were 163 designs submitted in the competition for a new free library, Tamworth. The design placed first is by Mr. E. R. Danford, A.R.I.B.A., architect, Temperance Hall, Northampton; the second design is by Messrs. Herbert T. Buckland and E. Haywood Farmer, architects, Birmingham; and the third design is by Messrs. Hodge and Haswell, architects, Teddington. The assessor was Mr. Jethro A. Cossins, architect, of Birmingham.

CHIPS.

A proposal has been made to place a window in Strathfieldsaye Church to the memory of the late Duke of Wellington.

Mr. H. C. Richards, K.C., M.P., has intimated his intention to give to the parish church of St. Peter, Newlyn, a stained-glass window in memory of the late Lord Salisbury. The window, which is designed as a companion to that in memory of the late Lord Idlesleigh, will illustrate the parable of the Good Shepherd.

Plans have been prepared for the construction of a new dock in Trafford Park, Manchester, on the north-easterly side of Trafford Hall.

It is proposed to provide a bridge for vehicular traffic across the Wye, near Tintern Abbey. At present persons proceeding between Tintern and the Forest of Dean have to go round either by Chepstow or over Bigsweir Bridge, either being several miles out of their way. Towards the estimated cost, the Lydney District Council have voted £1,200, and the Gloucester County Council, £1,000.

The King's Norton Urban District Council have accepted an offer from Messrs. Cadbury Brothers of a piece of land at the corner of Bournville-lane, Stirchley, containing 1,240 square yards, for public baths and washhouses, conditional upon the necessary buildings being erected, at a cost of not less than £5,000.

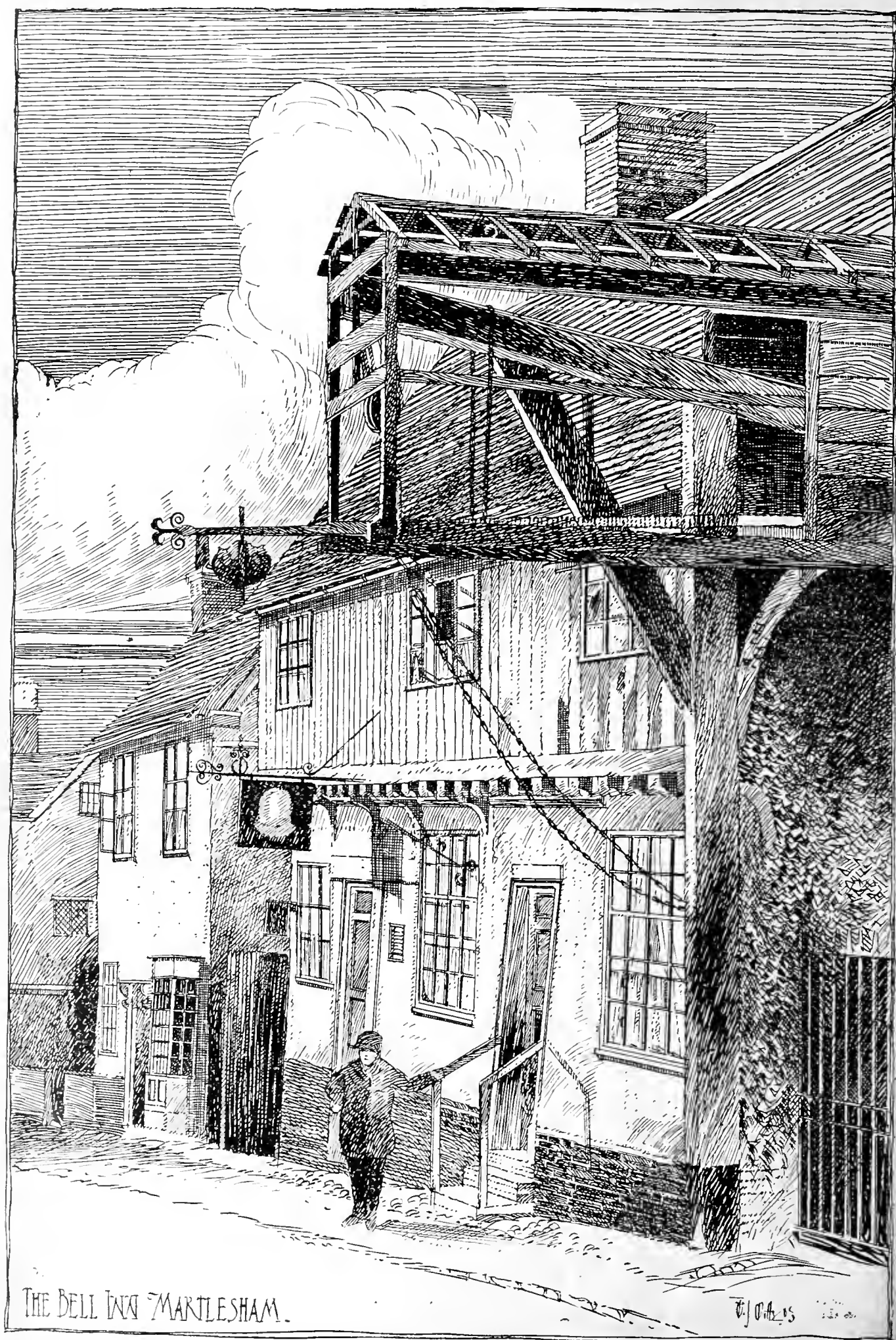
Messrs. Wailes and Strang, artists in stained glass, Newcastle-on-Tyne, have despatched, per ss. *Manitoba*, a large window of three lights, and also lancet window for St. Luke's Church, Woodstock, New Brunswick, Canada. The windows will be unveiled on Christmas Day.

A new aisle was opened on Tuesday in the Church of the Immaculate Conception, better known as the Jesuit Church, Farm-street, Berkeley-square. The aisle, which is in the Flamboyant Gothic style, has five chapels—one, near the main entrance in Farm-street, being a Calvary chapel in memory of Mr. Bertam Currie, and another, to the left of the high altar, is dedicated to St. Ignatius Loyola.

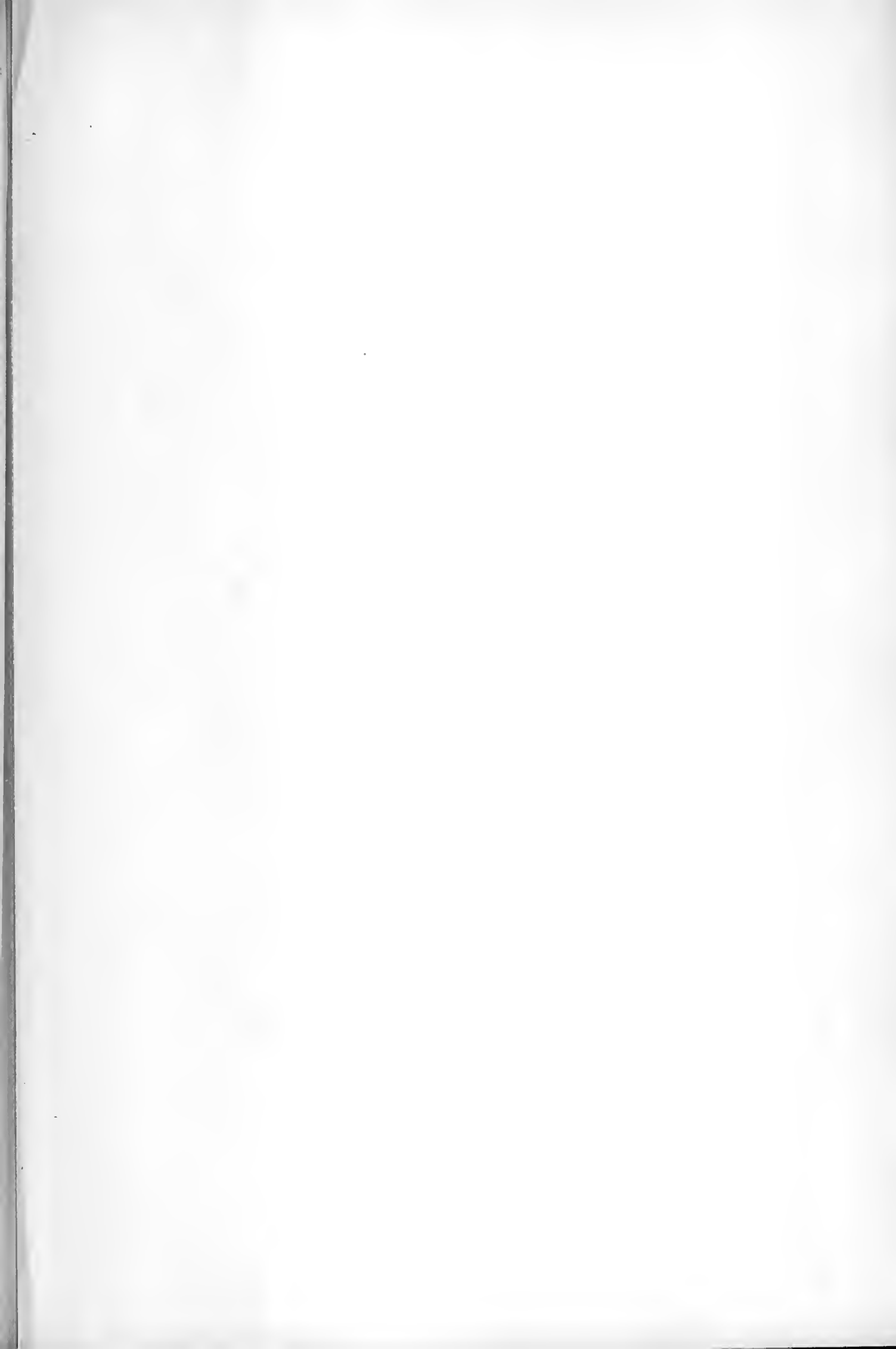
Very good progress is being made with the laying of the second pipe of the Thirlmere line of aqueduct to Manchester. Over a thousand men are engaged on the work, and during the last fortnight about a mile of pipe has been laid. Only eight and a half miles now remain to be laid, and it is expected that the work may be completed by next midsummer.

Mr. W. D. Barrow, executive engineer, on return from leave, has been appointed deputy consulting engineer to the Government of India for railways, Calcutta.

The Bishop of Colchester will unveil a memorial window and tablet to the memory of the late Bishop of St. Alban's (Dr. W. Festing) on Sunday next at Christ Church, Regent's Park, London, where the late Bishop was for many years vicar.



THE BELL INN MARTLESHAM.



THE BUILDING DEWS, DEC 18, 1903.

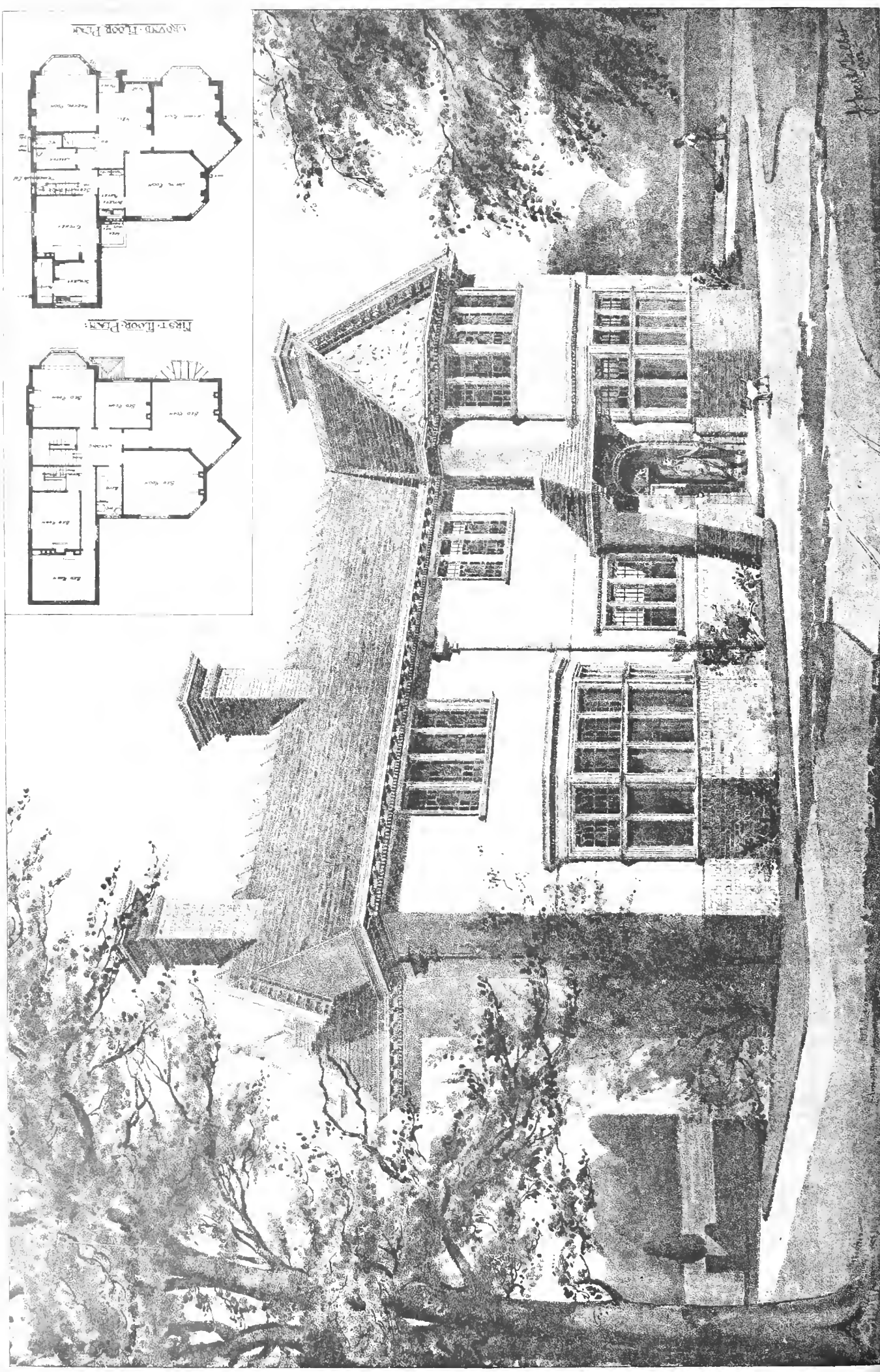
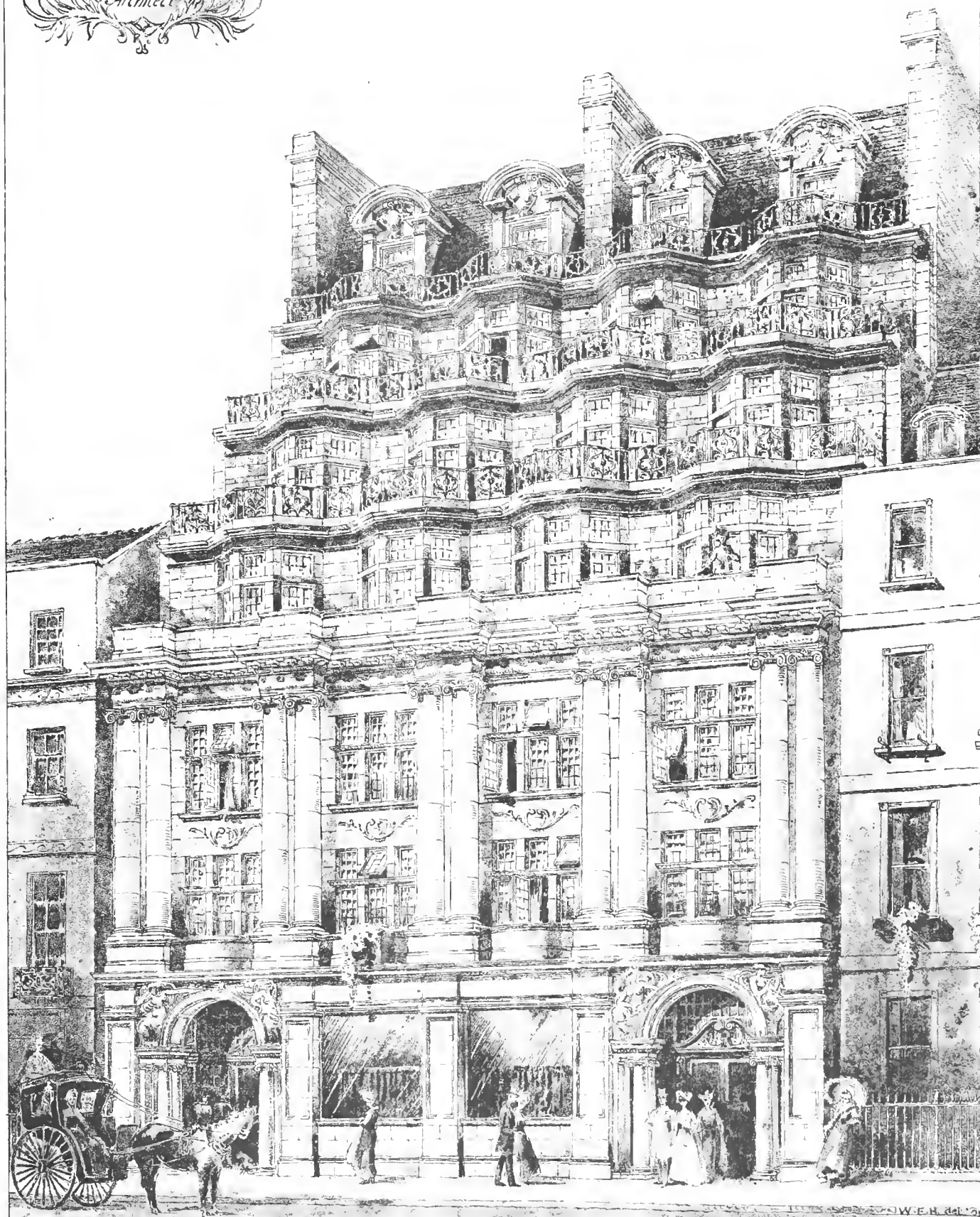


PHOTO. TINT. BY JAMES ALKEMAN, 6, QUEEN SQUARE, LONDON, W.C.

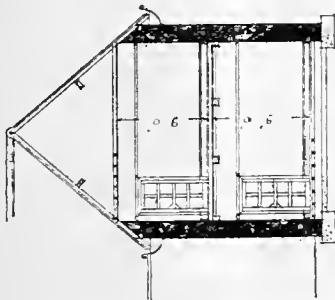


WATERLOO HOTEL JERMYN ST W G D MARTIN ARCHT

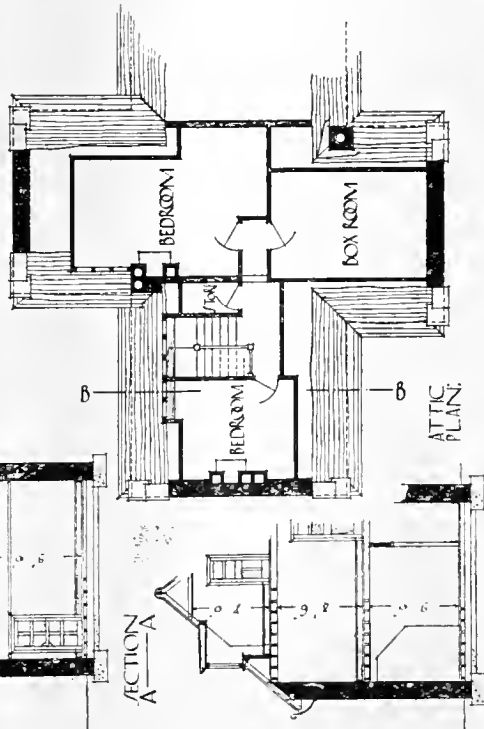
BUILDING NEWS' DESIGNING CLUB.

DESIGN FOR A SOLICITOR'S
COUNTRY HOUSE

BY "GHOTT" NOV 9-03

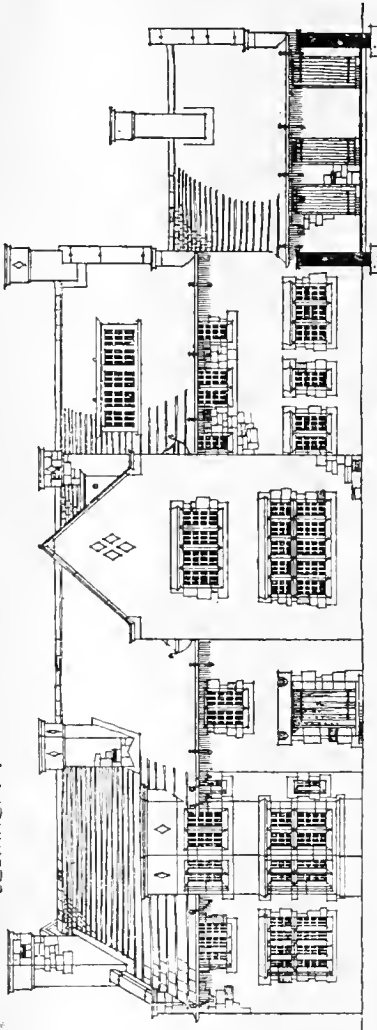


SECTION A

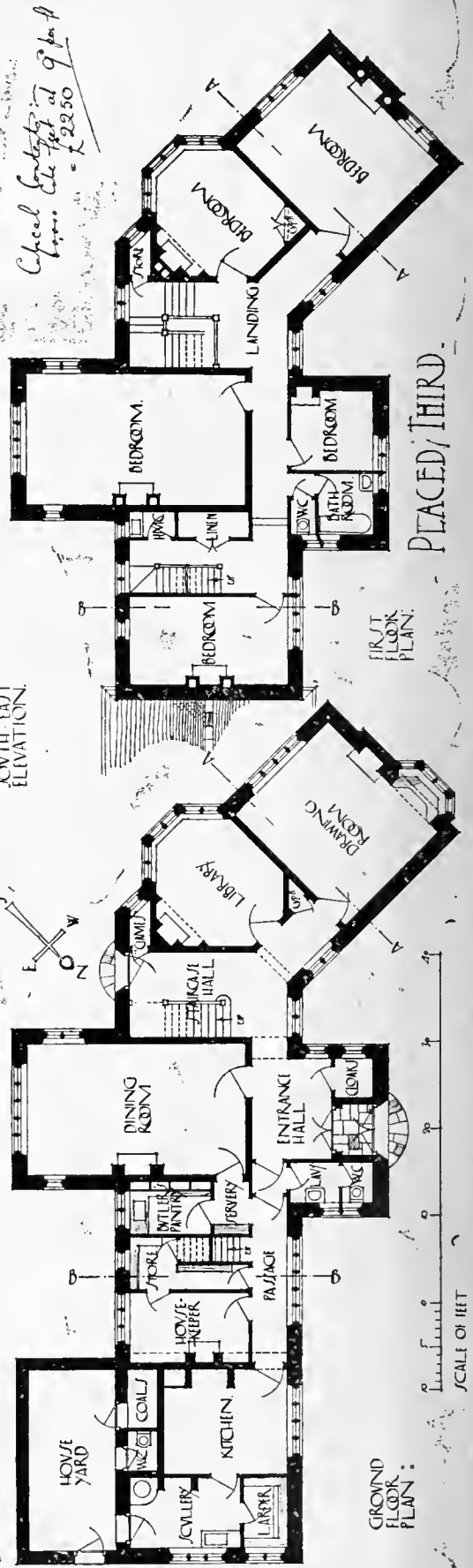


ATTIC PLAN

NORTHWEST
ELEVATION



SOUTH-EAST
ELEVATION



GROUND
FLOOR
PLAN

FIRST
FLOOR
PLAN

PLACED THIRD

Chapel built by the
same architect at 9 for 11
12250

SCALE OF FEET

PROFESSIONAL AND TRADE SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—The fourth ordinary meeting of this association was held in the hall of the Philosophical Society, 207, Bath-street, on Wednesday, the 9th inst., when a very interesting paper was read by Mr. Theodore Fyfe, architect to Dr. Evans's Excavations at Knossos. Excavations have been carried on at Knossos for four seasons since 1900 by Dr. Arthur Evans, and there is every probability of a fifth. Knossos is perhaps the most important of a series of palaces in the island of Crete of the Minoan period, a period anterior to that which produced the Mycenaean palaces on the mainland of Greece. Probably no other site, either in Greece or Egypt, has yielded such a variety of small finds, many of which, as well as the architectural features of the palace, are new, and of the first interest. It is evident that at Knossos also we find the true solution of all legends about the Minotaur and the Labyrinth of Crete. The date of the existing palace stretches from about 2000 to 1500 B.C., as important evidence of Egyptian influence has corroborated. An earlier and a later palace can be traced, the first having connections with the Egyptian Hyksos, or Shepherd Dynasties; the latter broadly contemporary with the Egypt of Thothmes III. It is highly probable that the Minoan races were the Kefim, or "people of the isles of the sea," represented as bringing tribute on an XVIII. Dynasty wall painting in a tomb at Thebes. The palace is, roughly speaking, four-square, with a great central court, which, being longer than it is wide, divides the plan into two portions—a western and an eastern—with connecting wings north and south. Standing on a slight eminence which has two steeply sloping sides, an opportunity is gained for a series of deep rooms on the east side, which consist of two and even three stories. These rooms constitute the most remarkable architectural developments of the site, but special mention should also be made of the throne room, on the western side, which has stone benches round the walls, and a curiously carved stone throne. The palace was originally decorated with splendid frescoes, in relief and in the flat. Among the interesting remains of these that have been found may be mentioned the upper part of a youth, very elegantly drawn, who is apparently carrying a vase of gold and silver. Many of the other finds are of extraordinary interest. Some 1,600 clay tablets show a highly-developed system of writing in a hitherto unknown style. Vases and other utensils have been found in pottery and fine stone, exhibiting the most beautiful workmanship and design. An almost complete ivory statuette of a leaping youth, a lioness's head in alabaster, and a life-size bull's head and foot in painted "gesso-duro" relief, are among the most perfect specimens of ancient art, and can hold their own with Greek work. A capability of working to great perfection in almost any material is evident—such materials as ivory, crystal, gold, enamelled porcelain, pottery, and fine stone—and the sum total of the discoveries enables us to know much that is interesting about life in a Minoan palace. The lecture was illustrated by a number of highly interesting slides. A discussion followed the reading of the paper, in which Mr. Newberry, Mr. Bromhead, and others took part.

INSTITUTE OF SANITARY ENGINEERS.—The annual dinner of the institute was held on Wednesday night at the Holborn Restaurant. Mr. W. J. Dibdin, president, occupied the chair, and the company numbered upwards of seventy gentlemen. The chairman, in responding to the toast of "The Institute," said it was formed in 1895, with a commencing number of about 100 members. This number had steadily increased, until at the present time the membership stood at 504, consisting of 266 Fellows, 19 members, 216 Associates, and three student members. During the present year seven Fellows, 36 Associates, and two student members had been elected. The objects of the institute were to provide an organisation for sanitary engineers, with the view of promoting the interests of the profession and of elevating its status. With this view examinations were held and certificates issued on their results. During the past year two examinations had been held in London and one in Manchester. At the London examination 21 candidates had presented themselves, and five at Manchester, 14 complying satisfactorily with the requirements of the examiner. Next year it was proposed to hold an examination in Liverpool. During the past year 20 lectures had been

given to students by men eminent in their respective professions, and one of the most useful features of the work of the institute was the arranging for Saturday afternoon visits of members and students to various places of interest where sanitation could be studied under practical conditions.

LEGAL INTELLIGENCE.

ACCIDENTS DURING MEAL-TIMES.—*BLOVELT v. SAWYER*.—In the Court of Appeal, on Friday, judgment was delivered by the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy in this action, which was an appeal from the decision of the Judge of the North Shields County-court in an arbitration under the Workmen's Compensation Act, 1897. On October 15, 1902, the appellant, a bricklayer in the employment of the respondent, was engaged on the building of a house more than 30ft. in height. During the morning he was working at building a wall. On the arrival of the dinner-hour, which was from 12 to 1, he sat down under the wall to eat his dinner. He had only just done so when the wall came down, and he was seriously injured. The evidence showed that the applicant might have gone away to have his dinner if he had liked, but that those men who brought their dinners generally stayed. On the occasion in question one bricklayer and one labourer went away for the dinner-hour; the rest remained. There were three bricklayers employed. The applicant received a little more than £2 a week, and it was stated that he was paid according to the number of hours he worked; but the dinner-hour was excluded in calculating the number of hours for which he received pay. The County-court Judge was of opinion that, as the applicant had sat down for the purpose of eating his dinner when the accident happened, the accident did not arise out of and in the course of his employment, and he therefore dismissed the application for compensation. The applicant appealed. The following cases were cited:—"Smith v. Lancashire and Yorkshire Railway Company" (1899); "Lowe and Pearson" (1899); "Armitage v. Lancashire and Yorkshire Railway Company" (1902). The Court allowed the appeal and remitted the case to the County-court Judge. The Master of the Rolls said that the applicant was a bricklayer who, at the time of the accident for which he claimed compensation, was engaged on building a house and was paid by the hour, though this did not appear from the judge's notes. The evidence only stated that he was receiving about £2 a week. He was at liberty either to go away during the dinner hour or to stay on the premises. He stayed, and sat down under a wall on which he had just been working for the purpose of eating his dinner, when the wall fell and he was injured. The County-court Judge had come to the conclusion that the accident did not arise out of and in the course of the applicant's employment. On the actual evidence he (the Master of the Rolls) would not have felt any difficulty in coming to a conclusion. It seemed to him that *prima facie* the applicant was in the employment of the respondent during the whole of each working day from the time when he went to his work to the time when he came away from his work, and just as much so during the dinner hour as during any other part of the day. He thought the time of employment embraced all the time occupied in coming, going, and stopping for any purpose ancillary to the applicant's work. It had, however, been stated to them that the applicant was not paid by the week or by the day, but by the hour, and that the dinner hour was excluded in the computation of the time for which he received payment, as being an hour during which he was not supposed to work. That, no doubt, created some difficulty, or at any rate afforded ground for some consideration. It seemed to him that if the dinner hour could be counted as part of the time to be used by the applicant for purposes ancillary to his work, as, for example, for eating necessary food, it would be taking a strained view to say that the pause in the work for dinner was a break in the employment. He thought that, notwithstanding the fact that the applicant was paid by the hour, and the dinner hour was excluded, the Court ought to take a broad view and treat the dinner hour as part of the time of employment. For the master to allow his workmen to have their dinner on the premises might very well be a matter of mutual convenience. He could not say as a matter of law that the applicant during the dinner hour ceased to be in the employment of the respondent. The appeal would therefore be allowed. The Lords Justices delivered judgment to the same effect.

THE LONDON WATER COMPANIES' ARBITRATION.—In the House of Lords, on Monday, before the Lord Chancellor and Lords Macnaghten, Shand, Davey, Robertson, and Lindley, an appeal was heard of the Kent Waterworks Company against decisions of Mr. Justice Joyce and the Court of Appeal (the Master of the Rolls and Lords Justices Romer and Cozens-Hardy) to the effect that the appellant company could not make up deficiencies in

back dividends earlier than the year 1864. Their Lordships unanimously dismissed the appeal. The hearing of the appeal had been accelerated for the purpose of finally deciding certain legal questions for the guidance of the London Water Companies' Arbitration, now sitting under the Act of last year.

LONDON WATER ARBITRATION BOARD.—At Tuesday's sitting of this Court the president delivered judgment on the claim of the East London Water Co. They held that the waters of the river Thames and Lea must be taken for the purposes of their award as capable of being supplied in good condition for domestic purposes, and, on the assumption that the undertaking was liable to be valued as subject to the payments to the Chamberlain's fund, awarded the company £3,900,000. If they were wrong as to that liability, the award would be £1,300,000. The company's taxed costs are to be paid by the Water Board. The company's claim was £6,583,934. After the Court had also given their decision on a point respecting the time of payment to the sinking fund for the Staines reservoir, the case of the West Middlesex Water Co. was opened.

FRONTAGE LINES.—James Rossdale, of Pembroke-villas, Bayswater, was summoned at Marylebone Police-court on Friday, at the instance of the London County Council, for erecting certain buildings at 60 and 62, Westbourne-grove, in contravention of the condition attached by the Council to their consent to the buildings being built beyond the general line of frontage. Mr. Thos. Chilvers prosecuted for the Council; Mr. Nonweiler, solicitor, defended. The district surveyor gave evidence that in November, 1902, the defendant applied for the Council's consent to the buildings being erected beyond the general line of frontage, and in March last the consent was given, subject to a condition that prior to commencing the work he should give up 6ft. of the forecourt, to be the public footway. The defendant agreed to the condition, but he had only surrendered 2ft. 6in. of the forecourt, although the buildings were well in progress, the remainder of the 6ft. being enclosed by a hoarding and a low wall. Mr. Nonweiler pointed out that the wall belonged entirely to the owner of the adjoining property, and that the hoarding had been put up to protect the public. Mr. Curtis Bennett remarked that in his opinion the defendant had committed a distinct fraud on the London County Council. He had obtained a concession subject to his first giving up a certain portion of land, and had gone on building without complying with the condition. He should make an order for the building to be pulled down at once. He also fined the defendant 40s., with two guineas cost.

CHIPS.

Mr. S. L. Pearce has been selected by the Electricity Committee of the Manchester City Council to succeed Mr. G. F. Metzger, on Feb. 1, as chief electrical engineer of that city, at a salary of £800. Mr. Pearce has been the deputy chief engineer since March, 1901.

The Duchess of Albany visited the County-hall, Kingston-on-Thames, on Friday, to unveil a statue of Queen Victoria, seated in the Coronation chair, which has been placed there as a county memorial of the reign of her late Majesty. It has been modelled by Mr. John Adams Acton, and executed in terracotta by Messrs. Doulton and Co., of Lambeth. Her Royal Highness also unveiled a South African war memorial tablet of latton, and a portrait of the present chairman of the Surrey County Council, Mr. E. J. Halsey, painted by Mr. William Carter.

Lord Monkswell, Chairman of the London County Council, unveiled, on Friday, a memorial to the late Sir Walter Besant, erected in the crypt of St. Paul's Cathedral, by the members of the Society of Authors, of which he was the founder, and other friends. The memorial takes the form of a bronze tablet with a portrait bust in the centre, surrounded by a wreath of laurel and supported by two bay trees, the work having been executed by Mr. G. Frampton, R.A. The tablet has been placed in the centre of the south wall of the crypt, between similar memorials to the late Charles Reade and George M. Smith (the originator of the "Dictionary of National Biography.")

At a special meeting, on Monday, of the Helensburgh Town Council it was unanimously resolved to make a still further extension of the works in progress for giving additional water storage. Instead of completing the supplementary reservoir for supplying Upper Helensburgh, as contracted for, the reservoir will be constructed to contain five million gallons instead of one million, the additional cost being £1,500.

The additions to the General Hospital, Rotherham, are being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves incased in richly-glazed faience, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

Telegraphic Address:—"Timeserver, London."

Telephone No. 1633 Holborn.

CHRISTMAS WEEK.

Owing to the interruption of business caused by the Christmas Holidays, the BUILDING NEWS for Dec. 23 will have to be published on WEDNESDAY MORNING, Dec. 23.

All advertisements for that issue, therefore, must reach as before 3 p.m. on TUESDAY, Dec. 22.

Correspondents and others will oblige by sending in Lists of Tenders, &c., at latest by the first post on Tuesday morning, Dec. 22.

NOTICE.

Bound copies of Vol. LXXXIII. are now ready, and should be ordered early (price 12s. each, by post 12s. 10d.), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLVI., XLIX., L., LII., LXII., LXIV., LXV., LXVI., LXVII., LXVIII., LXIX., LXXI., LXXII., LXXIII., LXXIV., LXXV., LXVI., LXXVII., LXXIX., LXXX., LXXXI., and LXXXII. may still be obtained at the same price; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Handsome Cloth Cases for Binding the BUILDING NEWS, price 2s., post free 2s. 4d., can be obtained from any Newsagent, or from the Publisher, Clement's House, Clement's Inn Passage, Strand, London, W.C.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 6d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 6d. (or 33fr. 30c.). To India, £1 6s. 6d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 6d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Situations and Partnerships.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" and "Partnerships" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

* Replies to advertisements can be received at the office, Clement's House, Clement's Inn Passage, Strand W.C., free of charge. If to be forwarded under cover to advertiser an extra charge of Sixpence is made. (See Notice at head of "Situations.")

Rates for Trade Advertisements on front page, and special and other positions, can be obtained on application to the Publisher.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—M. H. L.—H. R. S.—X. H. A.—W. C. T.—R. O. I.—F. E. M.—K. U. J.—B. O. B.

Correspondence.

COMPETITION FOR FREE LIBRARY, WAKEFIELD.

To the Editor of the BUILDING NEWS.

SIR,—The committee disapproves of the existing conditions of the above, but is endeavouring to obtain a revision of the same.

Reasons: "The Council will themselves decide and adjudicate upon the designs, and reserve power, if they think proper, to call in the services of an architect, not being a competitor, to assist them in deciding," &c.

Readers are requested to abstain from com-

peting unless they receive a further communication to the effect that the conditions have been satisfactorily revised.—I am, &c.,

HENRY A. SAUL, Hon. Sec.

Competition Reform Society,
10, Gray's Inn-square, W.C., Dec. 14.

BRIGHTON HOSPITAL COMPETITION.

SIR,—I am requested by my committee to ask if you will kindly request your correspondents in the current issue of your journal who have dealt with the result of above competition to communicate with Mr. Henry A. Saul, our hon. secretary, at the address below.

My committee are anxious to obtain further particulars about the matter, and would deem it a favour if you would give it such assistance.—I am, &c.,

C. E. HUTCHINSON, Assist. Hon. Sec.

Competition Reform Society,
10, Gray's Inn-square, W.C., Dec. 12.

Intercommunication.

QUESTIONS.

[12029].—Weight on Floor.—A floor is composed of joists 10 by 2, bearing 21ft. It is proposed to put a bookcase, 13ft. long, 2ft. wide, measured at base, weighing when full 3 tons, against one of the walls in which the joists bear. Without taking into consideration the weight of the bookcase, the joists are not really strong enough to take the weight usually required of an ordinary floor (viz., 1cw. per foot super.); but the floor shows an sign of deflection. According to "Hurst," p. 18 (1880 edition), a 10 by 12 joist, with 21ft. bearing, will take a safe load of some 47cw. placed at a distance of 1ft. away from the wall; so that, allowing in the present case that the bookcase will bear on twelve joists, the safe load on them, at 1ft. from wall, would be 23 tons. Am I right in considering that it will be safe to fix the bookcase as proposed, although, as pointed out, the floor itself is not strong enough to take the ordinary required distributed weight of 1cw. per foot super.? I argue as follows: The floor does its work satisfactorily at present, and as constructed it is strong enough to take a load of 23 tons distributed over a surface 13ft. in length, 1ft. away from the walls; therefore it is quite safe to load it with a bookcase weighing only 3 tons at that place, because the strain of the bookcase coming on the remainder of the floor need not really be considered. 2. Would the right way to determine the size of the joists (supposing a new floor were going to be put) be as follows? First calculate the joists to take the usual 1cw. per foot super., then calculate if they will take the desired extra weight at the desired place, deducting 1cw. for every foot super. occupied by the weight.—R.

[12030].—Footings and Easements.—In the course of a recent case in which I was interested as a witness, the learned judge's ruling was, to me, somewhat new, and I want any reader's opinion who is conversant with any settled law on the point, with references, if possible. My client (let us call him A.) bought a farm some thirteen years ago, and B. bought, at the same auction sale, an adjoining farm from the same owner. At one point the back of B.'s bare formed the boundary. On both A.'s and B.'s deeds the verge colour runs along the line of the back of the building, so that there is no dispute as to what, broadly, is the boundary. But the question is: Does B. own also the land on which his footings rest (which project 6in. beyond the face of his wall into A.), or does A. own it, subject to B.'s footings having a perpetual easement over it? If the former, then does this apply, however widely the footings or foundations spread? I have built upon railway sleepers, and upon creosoted timbers spreading sometimes 5ft. to 6ft. under the adjoining land. If the owner sells the building together with the land upon which it stands, does he sell that 5ft. or 6ft. width as well?—W. R.

An adjudication in bankruptcy has been made in the case of Clement Cooper Lloyd, of Halifax, architect and surveyor.

Mr. H. Conyers Kirby, chief assistant to the borough engineer of Polkestone, has been appointed to the post of sewerage engineer to the corporation of Blomfontein, South Africa, at a salary of £600 per annum. He sails on Jan. 11 to take up his duties.

The Swansea Corporation have decided that Mr. G. Swarbrick be promoted to the position of deputy surveyor at a salary increased to £225, that the salary of Mr. G. H. Bell be increased to £150, and that an estate agent and valuer be advertised for at a salary of £350 a year.

Mr. Batsford has for some time had in preparation an important folio volume entitled "Old Silver Work, Chiefly English, from the Fifteenth to the Eighteenth Centuries," edited by Mr. Starkie Gardner, F.S.A., with 120 colotype plates, which he was about to issue to subscribers on the 12th inst. The edition was, however, so seriously damaged in the recent fire at Messrs. Leighton's, the bookbinders, that he is obliged to defer the issue on account of the reprinting, which has become necessary. The subscription price is five guineas, but by some curious error it was mentioned in several newspapers as fifty-four guineas!

Our Office Table.

THERE was, unfortunately, practically no discussion at the Institute on Monday night, as at the finish of Mr. Henman's paper another gentleman occupied the time until ten o'clock, and then another from Birmingham got up and moved a vote of thanks in a speech which lasted a quarter of an hour, so that discussion was blocked out. Dr. Childs was afterwards asked by the President to say something, and when he commenced to condemn the "plenum" system, Mr. Henman excitedly appealed to the President to stop him. This evoked groans and other manifestations of disapproval. The President firmly, in very dignified terms, declined to allow the speaker to be interrupted. Dr. Childs was heartily cheered as he concluded his remarks. Mr. A. Saxon Snell then rose and indignantly protested against the whole time of the meeting having been taken up by Mr. Henman and his friends, discussion being thereby excluded, and asked for an adjournment of the meeting to another night to enable those present who desired to do so to express their views in respect to the "plenum" system, which he "was sure they all felt was a huge mistake." This gentleman's remarks were received with considerable applause and some cries of "No, no." The President of the Architectural Association supported the plea for an adjournment. The next meeting promises to be a lively one.

An open competitive examination for the appointment of four Assistant Civil Engineers in the Works Department of I.L.M. Naval Establishments at Home and Abroad will be held in London, commencing on Jan. 26, 1904. The limit of age for candidates is 23 to 28. The salary commences at £200 per annum, and rises by £15 a year to £300 per annum. Assistant Civil Engineers will, on first appointment, be on probation for two years, and will be eligible for promotion (by selection, without further examination), as vacancies occur, to the appointment of Civil Engineer (minimum £300, annual increment £20, maximum £350); Superintending Civil Engineer—(a) minimum £600, annual increment £25, maximum £750; (b) minimum £700, annual increment £25, maximum £850; to that of Assistant Director of Works (minimum £1,000, annual increment £50, maximum £1,200). Successful candidates will be required to satisfy the Medical Director-General of the Navy as to their physical fitness for the service. The fee for the examination will be £6. Further particulars may be obtained from the Director of Works, Admiralty, 21, Northumberland-avenue, London, W.C.

MR. HUBBARD, of the firm of Hubbard and More, architects and surveyors, 85, Greham-street, has just purchased in a London curiosity shop, for £25, a tarnished silver casket which proves to have been given, about the year 1550, to Diana of Poitiers by Henry II., King of France. The box is of wood, covered with gesso work. The casket stands on eight silver acorns, and at the corners of the lid and body are silver ornaments. A curious feature is a silver Moorish dome on the top. The South Kensington authorities look upon the find as a valuable discovery, and in a few days' time the casket will be exhibited at the museum.

The fourth annual meeting of the members of the Church Crafts League was held on Friday evening in Clifford's Inn Hall. The Dean of Westminster, who occupied the chair, explained that the object of the league was to infuse new life into the building, decoration, and furnishing of our churches, and to bring those who were responsible for these things into direct contact with artists of assured merit. It endeavoured to prevent our churches from being filled with machine-made goods, the ostensible cheapness of which was their one recommendation. The authorities of a parish church, however much they might desire to get the best workmanship, had but small opportunities for discovering the craftsman who was best qualified to give them what they wished. The result of this had generally been that they had been forced to turn to such advertisement as came in their way, and to order what they required from a shop catalogue. Artists, however, could not work as hack designers, for in so doing they would be false to their art: craftsmanship must be original and living work to have any value whatever. This league, therefore, supplied a connecting-link between the church authority and the craftsman

—a name, by the way, which included the architect and the painter, as well as the worker in stone, metal, or wood. Its endeavour was to keep on its committee men and women who were in close connection with the various kinds of arts and crafts, and through this committee to give advice to all those who might require any kind of church building or furnishing. That advice was given free, and the league was entirely devoid of commercial aims. During its four years' existence the league had received 387 applications for advice. The report of the committee was adopted, and the Bishop of Rochester was re-elected president of the league.

At the meeting on Monday night of the Scottish Society of Antiquaries, Mr. George Robertson, F.S.A.Scot., Keeper of the Abbey, Dunfermline, described two photographs of the recently discovered Norman door in the Abbey Church there, which were exhibited and presented to the society by Mr. W. Wybrow Robertson, F.S.A.Scot., H.M. Principal Architect and Surveyor of Works for Scotland. The doorway is situated at the south-east corner of the ancient Abbey Church, and had been built up for many years. It is 9ft. 7in. in height, and being of pure Norman architecture, is considered to be coeval with the original church erected about A.D. 1070. Its arch is ornamented with deeply-cut chevron mouldings, and its attached columns have finely-sculptured foliage scrolls on the capitals. A transverse slab, inserted in the columns at either end had apparently been placed there as a receptacle for the skeletons of two young persons, which were found underneath it among a mass of rubble and lime. H.M. Board of Works intends to open up and preserve this interesting doorway.

The Society of Architects' *Journal* gives a portrait and biographical sketch of the recently elected president, Mr. Walter W. Thomas. Born at Haverfordwest, Mr. Thomas received his early education at Aberystwith, with his father, who was headmaster of one of the most prominent private schools in the country, known as Pen-y-Parkau, from the small village near by. His son, Mr. Walter W. Thomas, was still young when he came to Liverpool, where for twelve years he studied architecture, finishing his architectural education at the Liverpool Institute under his old friend, Mr. John Finne, finally commencing practice in Melville Chambers. Soon after he moved to his present premises in Lord-street, where he has been established for the last 27 years. In 1886 Mr. Thomas joined the Society of Architects, and when, some three years ago, one of the vice-presidents was called abroad, the Council invited Mr. Thomas to occupy the position till the conclusion of the term of office. He has twice been re-elected, and lately was unanimously elected president. Amongst his numerous Liverpool buildings are Lewis's, the Bon Marché, the Philharmonic Hotel, Owen Owen's (in London-road), May Buildings, and Brook House. In Wales he has built a large number of board schools and workhouses. Mr. Thomas was for three years a member of the Toxteth School Board, until the district was absorbed into Greater Liverpool in 1895, in which year he was elected to the City Council without contest for the Princes Park Ward, and he is the only member of the council since that date who has been returned three times without opposition and held the seat for seven years. He was a member of the Health and Baths Committee, in the work of which he took a deep interest, especially the latter, of which he was the deputy-chairman. It will be remembered that while holding that office Mr. Thomas read an interesting paper on "People's Baths" before the Society of Architects. In a contested municipal election last year he was defeated by a strong opponent, and though asked to contest a ward last month he refused the honour in order to be able to devote more time to his duties as president of the Society.

At Colchester a Local Government Board inquiry has been held into the corporation's application for sanction to borrow £10,350 for purposes of the county lunatic asylum.

Mr. J. W. Penfold having signified his wish to retire from the office of honorary secretary, the council of the Surveyors' Institution have accepted his resignation with feelings of the greatest regret. Mr. Penfold's term of office will expire on December 31st, when Mr. Percival Currey, of 37, Norfolk Street, Strand, has consented to take up the duties of honorary secretary.

MEETINGS FOR THE ENSUING WEEK.

TO-DAY (FRIDAY).—Architectural Association. "Old Stucco and Plaster Work," by G. P. Bankart. 7.30 p.m.
Institution of Civil Engineers. "The Action of the Sea Upon the Fore-shore," by C. B. Case, Stud. Inst. C.E.; and "The Causes of the Loss of Beaches," by F. W. Cable, Stud. Inst. C.E. 8 p.m.
Glasgow Architectural Craftsmen's Society. Debate on "Should Architects be Arbitrators in Disputes on their own Work?" by R. W. Horn and Isaac Low junior. 8 p.m.

MONDAY.—Liverpool Architectural Society. Paper by E. Bertram Kirby.

TUESDAY.—Institution of Civil Engineers. "On the Resistance of Plane Surfaces in a Uniform Current of Air," by Thomas Ernest Stanton, D.Sc., Assoc. M. Inst. C.E. 8 p.m.

LATEST PRICES.

IRON, &c.

	Per ton.	Per ton.
Rolled-Iron Joists, Belgian.....	£5 10 0 to	£5 15 0
Rolled-Steel Joists, English.....	6 10 0 "	6 12 6
Wrought-Iron Girder Plates.....	7 0 0 "	7 5 0
Bar Iron, good Staffs.....	8 5 0 "	8 10 0
Do., Lowmoor, Flat, Round, or Square.....	20 0 0 "	20 0 0
Do., Welsh.....	5 15 0 "	5 17 6
Boiler Plates, Iron—		
South Staffs.....	8 15 0 "	8 15 0
Best Suedshill.....	9 10 0 "	9 10 0

Angle 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bending, &c., £7 7s. 6d.

Builders' Hoop Iron, galvanised, £12 to £13 per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20.	No. 22 to 24.
6ft. to 8ft. long, inclusive gauge.....	£11 15 0 "	£12 0 0
Best ditto.....	12 5 0 "	12 10 0
Cast-Iron Columns.....	£6 10 0 to	£8 10 0
Cast-Iron Stanchions.....	6 10 0 "	8 10 0
Rolled-Iron Fencing Wire.....	8 0 0 "	8 5 0
Rolled-Steel Fencing Wire.....	6 5 0 "	6 10 0
Galvanised.....	7 15 0 "	8 0 0
Cast-Iron Sash Weights.....	4 12 6 "	4 12 6
Cut Clasp Nails, 3in. to 6in.....	9 5 0 "	9 5 0
Cut Floor Brads.....	9 0 0 "	9 0 0

Wire Nails (Points de Paris)—
6 to 7 8 9 10 11 12 13 14 15 B.W.G.
8/- 8 6 8/- 8 6 9 10 8 11 3 12/- 13/- per cwt.

Cast-Iron Socket Pipes—

	£5 15 0 to	£8 0 0
3in. diameter.....	5 12 6 "	5 17 6
4in. to 6in.....	5 7 6 "	5 10 0

[Coated with composition, 5s. 0d. per ton extra; turned and bored joints, 5s. 6d. per ton extra.]

Pig Iron—
Cold Blast, Lilleshall..... 105s. 0d. to 112s. 6d.
Hot Blast, ditto..... 85s. 0d. to 70s. 0d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. (plus 5 per cent.)—

Gas-Tubes.....	87½ p.c.
Water-Tubes.....	62½ "
Steam-Tubes.....	57½ "
Galvanised Gas-Tubes.....	55 "
Galvanised Water-Tubes.....	50 "
Galvanised Steam-Tubes.....	45 "

10cwt. casks. 5cwt. casks.

	Per ton.	Per ton.
Zinc, English (London mill).....	£23 0 0 to	£24 10 0
Do., Vieille Montagne.....	26 5 0 "	28 15 0
Sheet Lead, 3lb. and upwards.....	13 17 6 "	13 17 6
Lead Water Pipe (F.O.R. Lond.).....	14 7 6 "	14 7 6
Lead Barrel Pipe.....	15 2 6 "	15 2 6
Lead Pipe, Tinned inside.....	16 2 6 "	16 2 6
Do., and outside.....	17 12 6 "	17 12 6
Composition Gas-Pipe.....	16 2 6 "	16 2 6
Soil-Pipe (5in. and 6in. extra).....	16 2 6 "	16 2 6
Pig Lead, in lwt. pigs.....	10 16 8 "	10 17 6
Lead Shot, in 28lb. bags.....	15 0 0 "	15 0 0
Copper Sheets, sheathing and rods.....	71 0 0 "	71 5 0
Copper, British Cake and Ingot.....	58 10 0 "	59 10 0
Tin, Straits.....	123 10 0 "	124 0 0
Do., English Ingots.....	127 0 0 "	127 10 0
Spelter, Silesian.....	21 2 6 "	21 12 6

TIMBER.

	per load	£9 15 0 to	£18 0 0
Teak, Burmah.....		9 0 0 "	16 0 0
" Bangkok.....		3 7 6 "	6 5 0
Quebec Pine, yellow.....		4 5 0 "	7 10 0
" Oak.....		5 10 0 "	10 10 0
" Birch.....		4 0 0 "	9 0 0
" Elm.....		4 15 0 "	8 0 0
" Ash.....		2 10 0 "	6 10 0
Danish and Memel Oak.....		3 5 0 "	5 10 0
Fir.....		2 7 6 "	5 5 6
Wainscot, Riga P. log.....		4 0 0 "	6 0 0
Lath, Danish, p.f.....		4 0 0 "	6 0 0
St. Petersburg.....		7 15 0 "	8 0 0
Greenheart.....		7 0 0 "	15 0 0
Box.....		0 3 6 "	0 8 9
Sequoia, U.S.A., per cube foot			
Mahogany, Cuba, per super foot			
lin. thick.....		0 0 6 "	0 0 8
" Honduras.....		0 0 6 "	0 0 7
" Mexican.....		0 0 4 "	0 0 5
" African.....		0 0 8 ½ "	0 0 5 ½
Cedar, Cuba.....		0 0 8 "	0 0 3 ½
Honduras.....		0 0 8 ½ "	0 0 3 ½
Satinwood.....		0 0 10 "	0 1 9
Walnut, Italian.....		0 0 3 "	0 0 7 ½
" American (logs).....		0 0 8 1 "	0 0 8 1

Deals, per St. Petersburg Standard, 120—12ft. by 1½in.

by 1½in.:			
Quebec Pine, 1st.....	£22 0 0 to	£29 5 0	
" 2nd.....	19 5 0 "	23 10 0	
" 3rd.....	11 15 0 "	14 0 0	
Canada Spruce, 1st.....	11 15 0 "	15 10 0	
" 2nd and 3rd.....	8 10 0 "	10 0 0	
New Brunswick.....	8 0 0 "	9 15 0	
Riga.....	7 10 0 "	8 10 0	
St. Petersburg.....	8 0 0 "	16 10 0	
Swedish.....	11 0 0 "	19 0 0	
Finland.....	9 0 0 "	10 0 0	
White Sea.....	11 10 0 "	19 0 0	
Battens, all sorts.....	6 10 0 "	14 10 0	
Flooring Boards, per square of 1in.:			
1st prepared.....	£0 13 0 "	£0 19 0	
2nd ditto.....	0 12 0 "	0 18 0	
Other qualities.....	0 5 9 "	0 14 0	

Staves, per standard M.:

U.S. pipe.....	£37 10 0 "	£45 0 0
Memel, cr. pipe.....	220 0 0 "	230 0 0
Memel, brack.....	190 0 0 "	200 0 0

STONE.*

Darley Dale, in blocks.....	per foot cube	£0 2 8
Red Mansfield ditto.....	" "	0 2 4 ½
Hard York ditto.....	" "	0 2 10
Ditto ditto 6in. sawn both sides, landings, random sizes.....	per foot sup.	0 2 8
Ditto ditto 3in. alaba sawn two sides, random sizes.....	" "	0 1 8

* All F.O.R. London.

Bath Stone, delivered on rail at quarry stations per foot cube £0 1 0

Delivered on road waggons, Paddington Depot..... " " 0 1 6 ½
Ditto ditto Nine Elms Depot..... " " 0 1 8 ½

Portland Stone, in random blocks of 20ft. average:—

	Brown	White
Delivered to railway depot at the quarry.....	per foot cube £0 1 5 ½	£0 1 7 ½
Delivered on road waggons at Paddington Depot.....	" " 0 2 1	0 2 2 ½
Ditto Nine Elms Depot.....	" " 0 2 1	0 2 2 ½
Ditto Pimlico Wharf.....	" " 0 2 1	0 2 2 ½

OILS.

Linseed.....	per tun	£17 15 0 to	£18 5 0
Rapeseed, English pale.....	" "	23 15 0 "	24 5 0
Do., brown.....	" "	22 5 0 "	22 10 0
Cottonseed, refined.....	" "	19 0 0 "	21 0 0
Olive, Spanish.....	" "	32 0 0 "	32 5 0
Seal, pale.....	" "	28 0 0 "	30 0 0
Cocoonut, Cochín.....	" "	30 0 0 "	31 0 0
Do., Ceylon.....	" "	25 0 0 "	25 10 0
Palm, Lagoa.....	" "	28 0 0 "	28 10 0
Olefin.....	" "	17 5 0 "	19 5 0
Lubricating U.S.....	per gal.	0 7 0 "	0 8 6
Petroleum, refined.....	" "	0 0 5 ½ "	0 0 0
Tar, Stockholm.....	per barrel	1 6 0 "	1 6 0
Do., Archangel.....	" "	9 19 8 "	1 0 0
Turpentine, American.....	per tun	87 0 0 "	87 5 0

CHIPS.

The corporation of Preston have approved of the introduction of a water supply extension Bill next session. The estimated outlay is £200,000.

The London County Council adopted on Tuesday the recommendation of the Highways Committee that the Standing Orders be suspended to enable the Council to consider, on December 22, at the special meeting summoned for the purpose, a recommendation on the subject of the Council's exercise of its powers of purchase in respect of the London Southern Tramways Company, subject to the Lambeth Borough Council agreeing, before December 19, to contribute one-third of the net cost of the necessary street widenings. An amendment omitting the reference to the Lambeth Council was defeated.

The Lambeth Art Club had an "at home" on Saturday afternoon and evening at the rooms of the Lambeth Art Schools, St. Oswald's-place, Upper Kennington-lane, where the attractions took the form of an art exhibition, with musical and other entertainments. Mr. J. W. Godward presided, being supported by Mr. McKeggie, head master of the schools, Miss Lucy Millett (hon. secretary of the club), and other artists who have been associated with the school work. In the art exhibition were included special competition works for the occasion, which were criticised by Mr. Robert Sanber; also work for the ordinary South Kensington certificates, and for the London County Council competitions.

At the last meeting of the city council of Liverpool, a long and heated discussion arose over a recommendation by the Baths Committee "that the design for the erection of baths on the George's Dock site marked No. 6 be approved subject to the elevations and treatment of open space being amended to the satisfaction of the Baths Committee, and that the author of the design, Mr. Alfred Saxon Snell, F.R.I.B.A., 22, Southampton Buildings, Chancery-lane, London, be engaged to carry out the scheme, and that he be paid a commission of £5 per centum upon the original contract price of the building, in accordance with the terms of the conditions of the competition, and that an application be made to the Local Government Board for sanction to borrow the sum of £75,000 to carry out the work, the consideration of which was postponed by the Council on October 29, 1903." Eventually the recommendation was again referred back to the committee.

LIST OF COMPETITIONS OPEN.

Ellesmere—Sewage-Disposal Scheme	100gs.	R. E. Lloyd Clerk, Ellesmere	Dec. 30
Aviesford—Single-Span Stone Bridge over Midway (Assessor)	25gs.	The Town Clerk, Maidstone	Jan. 1
Windsor—Elevations for Police and Fire Brigade Stations	25gs.	E. A. Stickland, A.M.I.C.E., Borough Surveyor, Windsor	15
Wakefield—Free Library		Chas. Jas. Hudson, Town Clerk, Town Hall, Wakefield	20
Borstal, Rochester—Chancel, &c.		St. Matthew's Vicarage, Borstal, Rochester	31
Erdington—Council House and Free Library (Wm Henman, F.R.I.B.A., Assessor)	£50, £30, £20	Herbert H. Humphries, Eng., Public Hall, Erdington, Birmingham	Feb. 1
Ilkley—Free Library, Public Offices, and Assembly Hall	£100, £50, £20	Frank Hall, Clerk, Council Offices, Ilkley	1
Vienna—Machinery to Lift Boats	100,000, 75,000, and 50,000 kronen	The Austro-Hungarian Con.-Gen, 23, Laurence-Pountney-lane, E.C. Mar. 31	
Rhyl—Pavilion (10,000 places) at National Eisteddfod		H. A. Tilby and J. W. Jones, Gen. Secs., Town Hall, Rhyl	—
Torquay—Carnegie Public Library and Municipal Buildings, Upton Valley (Assessor)	50gs., 30gs.	Fredk. S. Hex, Town Clerk, Town Hall, Torquay	—

LIST OF TENDERS OPEN.

BUILDINGS.

Eckington—Lock-up and Courthouse	Derbyshire County Council	J. Somes Story, County Surveyor, St. Mary's Gate, Derby	Dec. 19
Rotherham—Thirty-five Dwellings, Lord-street	Town Council	J. Platts, Architect, High-street, Rotherham	19
Pontliff—Repairing Railway Inn	Mrs. Knell	T. Roderick, Architect, Glebeland, Merthyr	19
Tarves—Stable, Coach-house, &c.	W. A. Archbold	James Cobban, Estate Office, Haddo House, N.B.	19
Alnwick—Villa	Victoria Hospital Committee	W. Robson Hindmarsh, Architect, Alnwick	19
Swindon—Victoria Memorial Lodge	Motor Garage Co.	Thos. Roberts, Secretary, Victoria Hospital, Swindon	19
Tredegar—Repairing Red Lion	Annfield Plain Co-op. Society, Ltd.	T. Roderick, Architect, Glebeland, Merthyr	19
Alnwick—Motor Garage and Cycle Works	Urban District Council	W. Robson Hindmarsh, Architect, Alnwick	19
Sacriston—Seven Houses	Committee	G. T. Wilson, Architect, 22, Durham-road, Blackhill, Durham	19
Halifax—Villa, Upper Greenroyd Estate	S. Rushforth	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	19
Mallow—Sixteen Artisans' Dwellings	H. S. Winter	Brian E. F. Sheehy, Architect, 57, George-street, Limerick	21
Roseyards, Co. Antrim—Presbyterian Church	District Lunacy Board	S. J. M'Fadden, Architect, Queen-street, Coleraine	21
Adwalton—Three Houses at Moorside	Duke of York Building Club	Rusforth and Co., Ltd., Adwalton, Yorks	21
Ebchester—Reading-Room	J. Taylor	W. T. Spence, Architect, Shotley Bridge, Durham	21
Wombwell—Villa, Hough-lane	Corporation	Jno. Robison, Architect, Park Cottage, Wombell, Yorks.	21
Glasgow—Additions to Nurses' Home at Gartloch Asylum	Llanfangel-y-Croyddin School Bd.	The Master of Works' Office, 266, George-street, Glasgow	21
Tylorstown—Sixty-Four Houses	Lancashire and Yorkshire Ry. Co.	D. C. Evans, Secretary, Duke of York Hotel, Tylorstown, Wales	21
Skibbereen—Post Office	Guardians	H. Williams, Secretary, Office of Public Works, Dublin	21
Bridlington—Alterations to St. George's Hall	H.M. Commissioners of Works	J. Earnshaw, Architect, Carlton House, Bridlington	22
Harrogate—Tea-House in Collin Fields	Guardians	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	22
Cwmystwith—Master's House	Balrothery R.D.C.	J. A. Jones, Architect, 7, Queen's-terrace, Aberystwith	22
Liverpool—Roofing Over Loading Mound at Banfield Depot	F. W. Wrigley	The Engineer's Office, Architects' Bank, Manchester	22
Bury, Lancs.—Workhouse Hospital	Borough Council	Alfred Hopkinson, Architect, 15, Agur-street, Bury, Lancs.	22
Stonehaven—Additions to Town Hall	Urban District Council	D. and J. R. McMillan, Architects, 211, Union-street, Aberdeen	22
Middlesborough—Enlargement of Post Office	Urban District Council	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	23
St. Austell—Additions to Workhouse	Mrs. Head	J. Mutton, Architect, Charlestown, St. Austell, Cornwall	23
Lusk—Labourers' Cottages	Building Committee	A. Scott, C.E., 34, Lower Sackville-street, Dublin	23
Seascale—Villa	North Uss School Board	J. Wrigley and Sons, Seascale, Cumberland	23
Brighton—New Stand on Racecourse	King-ton Union Guardians	W. C. and A. S. Maoning, Architects, Newmarket	23
Stanley—Twenty-four Houses	Maldon Rural District Council	Wm. Forster, Architect, Front-street, Stanley, Durham	23
Kendal—St. Thomas's Mission Hall, Sandes-avenue	Society of Friends	J. F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	23
Rugley, Staffs.—Engine Shed	H.M. Commissioners of Works	W. E. Rogers, Surveyor, Anson-street, Rugeley, Staffs.	24
Marsh, Huddersfield—House, Luck-lane	Urban District Council	P. Taylor and Co., Architects, Central Buildings, Milsbridge	25
Inverallort—Cottage, Dairy, &c.	Guardians	L. and J. Falconer, Architects, Fort William, N.B.	26
Falkirk—Erskine U.F. Church, Hodge-street	Board of Guarantors	A. and W. Black, Architects, Falkirk, Scotland	28
Lochmaddy—Alterations to Public School	Hon. R. Dawson	R. F. Matheson, Claddach, Kirkibost, Lochmaddy	28
New Malden—Cottage Homes	Gas Committee	Wm. H. Hope, Architect, Seymour-road, Hampton Wick	28
Bradford—Shop and Workrooms	Admiralty	C. H. Hargreaves, Architect, Exchange Buildings, Bradford	28
Bradwell-on-Sea—Six Workmen's Cottages	F. A. Guy, J.P.	H. G. Keywood, Surveyor, Maldon, Essex	28
Lancaster—Assembly Hall	Heston and Isleworth U.D.C.	S. E. Barrow, Architect, Liverpool Bank Chambers, Lancaster	28
Cardiff—Superstructure of New Government Offices	Education Committee	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	29
Horsham—Stabling, &c.	West Ham Union Guardians	S. Mitchell, 14, Market-square, Horsham, Sussex	30
Beaumaris—Warehouse and Offices at Pier	East Ham Urban District Council	W. O. Griffith, Secretary, 1, New-street, Beaumaris	30
Farnham—Separation Wards at Workhouse	Corporation	Friend and Lloyd, Architects, Grosvenor-road, Aldershot	31
Hillsborough—Two Villas	Urban District Council	Henry Hobart, Architect, Dromore, Co. Down	31
Asburbton—Additions to Lent Hill	Heston and Isleworth U.D.C.	F. W. Vanstone, Architect, Palace Chambers, Paignton	31
Stafford—Nurses' Home at Workhouse	Great Western Railway Co.	H. T. Sandy, Architect, Stafford	31
Devonport—Buildings at Gasworks	Education Committee	Sidney E. Stevenson, Engineer, Gasworks, Devonport	31
Herne Bay—Coastguard Station	West Ham Urban District Council	The Director of Works Dept., 21, Northumberland-avenue, W.C.	Jan. 1
Castlebrook—Six Houses	Corporation	J. M. Robinson, Architect, 7, East-wall, Londonderry	1
Hounslow—Public Library, Treaty House Estate	Urban District Council	Nowell Parr and A. E. Kates, Architects, Brunswick House, Brentford	4
Southampton—Portwood Schools	Heston and Isleworth U.D.C.	The Borough Engineer, 123, High-street, Southampton	4
Tonypandy—Extension of Trinity Hall	Corporation	R. S. Griffiths, Architect, Excelsior Buildings, Tonypandy	4
Hounslow—Public Swimming Baths, Treaty House Estate	Urban District Council	Nowell Parr and A. E. Kates, Architects, Brunswick House, Brentford	4
Neath—New Roofs to Market	Heston and Isleworth U.D.C.	D. M. Jenkins, A.M.I.C.E., Boro' Engineer, Gwyn Hall, Neath	4
Lurgan—Free Library	Great Western Railway Co.	H. Hobart, Architect, Dromore, Co. Down	4
Hounslow—Public Offices, Treaty House Estate	Education Committee	Nowell Parr and A. E. Kates, Architects, Brunswick House, Brentford	5
St. Austell—Goods Shed	West Ham Union Guardians	J. S. Moffat, Architect, 53, Church-street, Whitehaven	5
Whitehaven—Rebuilding Presbyterian Church and Manse	East Ham Urban District Council	F. J. Hatchard Smith, F.R.I.B.A., 41, Morgate Station Buildings, E.C.	6
Gillingham—School (300 places), Napier-road	Guardians	Adam Horsburgh Campbell, Engineer, Town Hall, East Ham, E.	11
Leytonstone—Lunatic Wards	Corporation	P. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria-st., S.W.	12
Manor Park, E.—Carnegie Library, Romford-road	Gibbs, Mew, and Co., Ltd.	John Eltringham, Architect, 62, John-street, Sunderland	Feb. 1
Paddington, W.—Extension of Harrow-road Workhouse	Committee	John Harding and Son, Architects, Salisbury	—
Sunderland—Additions to Victoria Hall	Grain Co., Ltd.	Walter Webb, Architect, Bargate, Whitechurch	—
Allington—Rebuilding Old Inn	Committee	Brown and Burgess, Architects, Princess-street Chambers, Ipswich	—
Whitchurch, Shropshire—Alexandra Temperance Hotel	Grain Co., Ltd.	G. H. V. Cule, Architect, Birmingham	—
Ipswich—Additions to Nurses' Wing at Hospital	Grain Co., Ltd.	H. and E. Marlen, Architects, Chapside Chambers, Bradford	—
Castleford—Free Library	Grain Co., Ltd.	H. Budgen, Architect, 93, St. Mary-street, Cardiff	—
Pannal, Yorks—Cottage, South End Park	Grain Co., Ltd.	E. R. Beckwith, Architect, 10, Trinity-street, Colchester	—
Colchester—Warehouses, Collingdon-road	Grain Co., Ltd.	The London Land Co., Ltd., 9, Great Castle-st., Oxford Circus, W.	—
Colchester—Electrical Works, Hythe Causeway	Grain Co., Ltd.	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	—
New Barnet—Seven Houses, Willenhall Park Estate	Grain Co., Ltd.	Wm. F. Bird, C.E., Surveyor, Midsomer Norton	—
Canterbury—Blackman Ward and Alterations to Hospital	Grain Co., Ltd.	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	—
Midsomer Norton—Additions to Town Hall	Grain Co., Ltd.		—
Brampton—Co-operative Stores	Grain Co., Ltd.		—

ELECTRICAL PLANT.

Whitby—Installing Electric Light at Temperance Hall	East Indian Railway Co.	A. Palframan, Leesholme, Bagdale, Whitby	Dec. 19
London, E.C.—Electric Plant	Urban District Council	C. W. Young, Secretary, Nicholas-lane, E.C.	24
Pontypridd—Free Wiring	Corporation	Reginald P. Wilson, 66, Victoria-street, Westminster	28
Goyan—Electric Capstan, &c.	Urban District Council	Theodore C. Parsons, Boro' Elec. Eng., Helen-street, Goyan	28
Sydney—Telegraph Materials	Borough Council	The Deputy Postmaster-General, Sydney, New South Wales	30
Long Eaton—Extension Plant	Wallasey Urban District Council	Frank Worrall, A.M.I.C.E., Electricity Supply Works, Long Eaton	Jan. 1
Hackney, N.E.—Mains	Lunatic Asylum Committee	Robert Hammond, M.I.C.E., 61, Victoria-street, Westminster, S.W.	16
Egremont—Cables (7,100 yards)	Corporation	J. A. Crowther, Electric Supply Works, Sea View-road, Liscard	20
Emmsworthy—Plant	Corporation	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	—
Canterbury—Wiring Hospital for Electric Lighting	Corporation	Jas. Dickie, Town Clerk, Irvine, N.B.	—
Irvine—Electric Installation	Corporation		—

ENGINEERING.

Hamilton—Steel Girder Bridge	School Board	W. L. Douglass, C.E., District Engineer, District Offices, Hamilton	Dec. 21
Swansea—Heating Apparatus at St. Helen's Board School	Harbour Trustees	G. E. T. Laurence, A.R.I.B.A., 22, Buckingham-street, W.C.	21
Annan—Enlargement of Quay	Improvement Committee	Murray Little, Clerk, Annan	21
Halifax—Steel Footbridge over Canal	Gas Committee	Jas. Lord, C.E., Boro' Engineer, Town Hall, Halifax	21
Pontypridd—Two Luteless Purifiers	Urban District Council	J. Coleau Jones, Clerk, Council Offices, Pontypridd	21
Selby—Boring (400ft.)	St. Andrew's Hospital Committee	Percy Griffith, M.I.C.E., 54, Parliament-street, Westminster	21
Norhampton—Septic Tank	Corporation	Beeby Thompson, 67, Victoria-road, Northampton	23
Burnley—Two Sewage Tanks	Corporation	G. H. Pickles, A.M.I.C.E., Borough Surveyor, Town Hall, Burnley	23
Glasgow—Steam Road-Roller	Corporation	Thomas Nisbet, Master of Works, City Chambers, Glasgow	23

ENGINEERING—continued.

Linton—Steel Girder Footbridge	Rural District Council	A. M. Cook, Surveyor, Linton, Cambs	Dec. 23
Swinton—Deepening Well	Urban District Council	Robert Fowler, C.E., Swinton, near Rotherham	" 23
Birkenhead—Laundry Machinery	Corporation	Chas. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	" 24
Grangemouth—Coal-Hoist Viaducts	Caledonian Railway Co.	Sir John Wolfe Barry, K.C.B., 21, Delahay-street, Westminster	" 28
Manchester—Diverting and Culverting Brook	Paving Committee	The City Surveyor's Office, Town Hall, Manchester	" 28
Hunstanton—Boiler at Waterworks	Urban District Council	J. S. B. Glasier, Clerk, New Hunstanton	" 29
Beaumaris—Subway at Pier	Board of Guarantors	W. O. Griffith, Secretary, 1, New-street, Beaumaris	" 31
Nenagh—Roadmaking Machinery	Tipperary County Council	The County Surveyor, Court House, Nenagh	" 31
Palermo—Steam Flour Mill	Urban District Council	The Honourable Senator Tasca-Lanza Sindie, Palermo, Sicily	" 31
Hadleigh—Borehole, High-street	Urban District Council	T. F. Corder, Surveyor, High-street, Hadleigh, Suffolk	" 31
Epsom—Pumping Plant	Urban District Council	Edward R. Capon, Surveyor, Bromley Hurst, Church-street, Epsom	" 31
Rotherham—Bacteriological Filters at Aldwarke	Sewerage Works Committee	R. E. W. Berrington, M.I.C.E., Bank Buildings, Wolverhampton	" 31
Cheshunt—Filtering Tank, &c.	Urban District Council	Pollard and Tingle, 31, Old Queen-street, Westminster	Jan. 1
Buntingford—Sinking Well	Rural District Council	John Chadwick, Engineer, Blethley, Bucks	" 4
Dublin—Six Steel Bridges	Great Northern (Ireland) Railway Co.	W. H. Mills, Engineer-in-Chief, Amiens-street, Dublin	" 4
Newburn—Bridge Widening	Urban District Council	Thos. Gregory, Surveyor, Newburn, Northumberland	" 4
St. Monans—Harbour Works	Harbour Commissioners	D. and C. Stevenson, C.E.'s, 84, George-street, Edinburgh	" 6
Aberdeen—Timber Wharf	Metropolitan Asylums Board	R. Gordon Nicol, Engineer, Aberdeen	" 6
Rotherhithe, S.E.—Repairing Front of South Wharf	London County Council	W. T. Hatch, M.I.C.E., Embankment, E.C.	" 11
London, S.E.—Tunnel Between Rotherhithe and Ratcliff	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	" 19
Greenwich, S.E.—Six Electrically Driven Boiler Feed-Pumps	Ministry of Public Works	The Clerk, London County Council, Spring Gardens, S.W.	" 19
Cairo—Three Road Bridges over the Nile	London County Council	The Com. Intel. Branch, Board of Trade, 50, Parliamt-street, S.W.	Feb. 1
London, S.W.—Plant		The Manager, Works Department, Belvedere-road, Lambeth, S.E.	—

FENCING AND WALLS.

Edmonton, N.—Railings at Brookfield Estate	Urban District Council	G. Eedes Eachus, M.I.C.E., Town Hall, Lower Edmonton	Dec. 21
Exmouth—Railings and Gates at Manor Grounds	Urban District Council	H. C. Adams, Clerk, Public Hall Chambers, Exmouth	" 28
London, S.W.—Post and Rail Fencing (2 miles)	London County Council	The Works Manager, Belvedere-road, Lambeth, S.E.	—

FURNITURE AND FITTINGS.

Wicklow—Forty Iron Bedsteads	Forehoe Union Guardians	Wm. Partridge Smith, Clerk, Union Offices, Vicar-st., Wymondham	Dec. 19
Leeds—Wood Benches, &c.	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	" 21
Leeds—Gymnasium Fittings	Guardians	The City Engineer's Office, Municipal Buildings, Leeds	" 21
Plymouth—Furnishing Scattered Homes	Education Committee	W. Adams, Clerk, Plymouth	" 22
Aberdeen—Furnishing Kingseat Asylum	Education Committee	C. B. Williams, Clerk, 20, Union-terrace, Aberdeen	" 22
Winchester—School Furniture	Education Committee	D. T. Cowan, The Castle, Winchester	" 23
Felling—School Furniture at Heworth Junior Schools	Guardians	George Bolam, Clerk, Council Buildings, Felling	" 26
Greenwich, S.E.— Windsor (800) and Bentwood (100) Chairs	Guardians	S. Saw, Clerk, Board-Room, Greenwich, S.E.	" 30
Greenwich, S.E.—Board-Room Furniture (Oak)	Guardians	S. Saw, Clerk, Board-Room, Greenwich, S.E.	" 30

PAINTING.

Alnwick—Cycle Works	Motor Garage Co.	W. Robson Hindmarsh, Architect, Alnwick	Dec. 19
Pontliff—Railway Inn		T. Roderick, Architect, Gbleland, Merthyr	" 19
Halifax—Villa, Upper Greenroyd Estate		A. G. Dalzell, Architect, 15, Commercial-street, Halifax	" 19
Alnwick—Villa	W. A. Archbold	W. Robson Hindmarsh, Architect, Alnwick	" 19
Tredgar—Red Lion Inn	District Lunacy Board	T. Roderick, Architect, Gbleland, Merthyr	" 19
Glasgow—Nurses' Home at Gartloch Asylum	F. W. Wrigley	The Master of Works' Office, 266, George-street, Glasgow	" 21
Seascale—Villa		J. Wrigley and Sons, Seascale, Cumberland	" 23
Kendal—St. Thomas Mission Hall, Sandes-avenue	Mrs. Head	John F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	" 23
Inverlort—Dairy, Cottage, &c.	North Uss School Board	L. and J. Falconer, Architects, Fort William, N.B.	" 25
Lochmaddy—Public School		R. F. Matheson, Claddach, Kirkibost, Lochmaddy	" 28

PLUMBING AND GLAZING.

Tarves—Stable and Coachhouse	Mrs. Knell	James Cobban, Estate Office, Haddo House, N.B.	Dec. 19
Glasgow—Nurses' Home at Gartloch Asylum	District Lunacy Board	The Master of Works' Office, 266, George-street, Glasgow	" 21
Stonehaven—Town Hall Additions	Society of Friends	D. and J. R. M'Millan, Architect, 211, Union-street, Aberdeen	" 22
Lancaster—Assembly Hall		S. E. Barrow, Architect, Liverpool Bank Chambers, Lancaster	" 28
Bradford—Shop and Workrooms		C. H. Hargreaves, Architect, Exchange Buildings, Bradford	" 28

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THE BUILDING NEWS

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ART AND INDUSTRY.

IF Mr William Morris had published his essays on the Arts and Crafts in dialogue form, the profession and the public would have more readily apprehended the force of the doctrines he so fervently advocated. He protested strongly against the influence of commerce upon art; he showed that tradition has transferred itself from art to commerce; that "the end proposed by commerce is the creation of a market demand, and the satisfaction of it when created for the sake of the production of individual profits." He convinced all thinking men that to the commercial producer the actual wares are nothing;—their adventures on the market everything. To the artist the wares are everything; his market he does not trouble about. Morris was always advocating the necessity for artists to become as good craftsmen as possible; if we cannot be good craftsmen in one line, to go down to the next, find our level in the arts, and be good in that; for, if we are artists at all, we shall be sure to find out what we can do well, even if we cannot do it easily. The aim of this great art reformer was to make art again the heritage of the people, to bring the craftsman and the artist together, and to make man's work no longer a toil for him. These are points upon which Mr. Walter Crane and Mr. Lewis F. Day have been discussing in a little volume entitled "Moot Points: Friendly Disputes upon Art and Industry," which deserves the perusal of all who have the interest of those pursuits at heart, published by Mr. T. Batsford.

"The Ideal Artist" is the title of the preliminary discussion, or dialogue. The first question turns on the vulgar and commercial in art, and it is to the meaning of these terms the disputants direct their attention. Mr. Walter Crane affirms that these characteristics are "quite antithetical to the artistic spirit." Of the meaning ordinarily attached to these terms there can be little doubt, though the disputants bring in side issues, which obscure the real question. We are not always sure that the terms are used exactly in the same sense. Mr. Lewis F. Day admits that vulgarity vitiates art; but doubts how we can "fairly deny the title of art to a good deal which is certainly vulgar," and he instances a comic artist, well known, who, though vulgar in his choice of subjects, was, nevertheless, an artist. Mr. Walter Crane rejoins by distinguishing between "vulgarity of treatment and vulgarity of subject." He truly says, "An artist in characterisation may make refined studies of common objects." The objects may be vulgar, but his characterisation of them is not so necessarily, and he instances Charles Keene, who drew vulgar types with astonishing artistic precision. There is a good deal to be said in favour of this distinction between treatment and subject. One man may idealise a common or vulgar object, and by so doing he lifts it to a higher plane, and may make it artistic. Even a wall paper can be made vulgar by representing human figures and animals, or other common objects, or a very naturalistic treatment of flowers or fruit, a common or vulgar type. Vulgarity and commercialism are to some extent in art at least synonymous. We all know that popular representations are generally imitative or natural. The average man and woman like their vases and objects of use covered by animal or floral devices or made to imitate some grotesque creature. These are

more popular with the lower orders of culture. Spencer has said truly that primitive man delights in objects that copy animals or natural forms. And something depends on the personality or mind of the artist. He may give a character to his object even if common, which removes it from the reproach of being vulgar. "L. F. D." thinks Versailles vulgar "in all its gilded glory," though Le Brun and his compeers were artists. We cannot admit the charge of vulgarity against the style of Louis XIV. at that palace; it is gorgeous and luxurious if we will, but hardly vulgar, and as Mr. Crane says, "style may redeem even pomposity and display" by raising it above the popular and catchpenny motive. The same writer says "the vulgarity of Louis XIV. decoration—if it is vulgarity—is almost refinement compared with some modern excesses." From the discussion on this question, there are evidently two conceptions of vulgarity, though both appear to admit there is some quality of mind or treatment which raises even a vulgar type to a higher level than it would otherwise have. Both of the combatants admit that style may redeem a vulgar style in such a manner that it may be called art; but they are not agreed as to the exact meaning to be attached to the word. The nearest approach to the definition is that vulgarity is a form of "modern commercial pictorial art, which is consciously catchpenny." The argument then turns to another issue—the motive of the artist. One of the disputants, Mr. Day, says: "An artist works to live"; the other, Mr. Crane, says: "No; an artist lives to work." Here the question of "commercialism" comes in. One argues that it is only when the artist thinks too much of money that it soils his artistic soul; the other thinks the money question has nothing to do with art. It is a nice point, but it does not appear to have anything to do with vulgarity as a positive quality in art. The disputants, indeed, appear to be arguing in a vicious circle when one interprets "vulgarity in art as the lack of that natural refinement or acquired culture which lifts it above the common," and the other that "what is common is not necessarily vulgar." A concrete case is presented by "L. F. D." He supposes a design for a carpet, in which cast shadows throw the ornament into strong relief, and he calls this vulgar. But if the composition were perfect, the drawing masterly, and the colour harmonious, he would not deny that the design was an artist's. "W. C." in reply, says if such a combination of good and bad qualities occurred in a design, he would say parts of it were excellent: the part that would make it "vulgar for you would make it in-artistic for me." Both these artists admit that taste is inseparable from art—art without taste becomes craft, taste is the essence of art. Commercialism is another point. "W. C." says "I mean by it simply that a man in his work thinks solely of profit-making, but "L. F. D." replies, "No artist thinks solely of profit-making." We may here quote. "W. C." says: "I do not think (commerce and commercialism) has any real connection with art. An artist, of course, may be, and indeed must be 'commercially competent' in the sense of being able to meet industrial conditions in designing to fix a value on his work; but profit-making is a separate business." "L. F. D.": "I don't see that. What is the difference between the profit an artist makes out of his invention, and that which a manufacturer makes out of his foresight, knowledge, and initiative?" "W. C." responds: "There is all the difference in the world between the profit of a manufacturer and the fee of an artist. The former runs a business with the object of making a profit. The latter is content to get a fair remuneration for his handiwork." The typical modern manufacturer only cares to produce what the public will buy; he only cares to

produce for profit and to sell. The artist is in a different position: he does not produce for profit; he only asks for a remuneration to live his life. The result of the discussion on this point does not lead to a definite conclusion if it clears the air. One view is that artists do not work for love of art practically, if they do so theoretically—money or profit is the chief object; while the other stoutly denies this assumption, but admits that artists "are all tied to the triumph car of commerce, and are more or less slaves of the financier and capitalist,"—an idea that is cleverly caricatured in a pen and ink sketch as a vignette at the conclusion of this discussion. Of course both disputants allow that the commercial may become extreme and fatal to the artistic, one compares the alliance to a *mariage de convenance* "When commercialism peeps in at the door, art is apt to fly out of the window." A perhaps more important discussion for all interested in architecture and the Arts and Crafts is that under the title of "Designer and Executant." We have so often taken up this question that we may be excused if we summarise only the various positions taken up by the disputants. One of them protests against the theory that every artist should carry out what he designs, and every workman design what he executes, while he admits that design should be adapted to its material, and executed with feeling. He does not see, however, that either of these depends upon the designer and executant being one. The designer can gain a good deal by seeing the work done in the workshop. The advocate of the union of designer and craftsman (Mr. Walter Crane) asserts, on the other side, that a designer is all the better for a first-hand acquaintance with the conditions and limitations of the work he is designing, and for this purpose he must actually work out his own design; but he is careful to say that the artist who executed his own designs under present conditions could not pay his rent and taxes. Economics come in again here. While one view is that the designer is better for carrying out his own work, the other view is that it is undesirable in many cases that one man should do both, for imaginative artists are not all good workers, and able workmen not all gifted with invention. Commercialism also has something to do with the present separation of designer and craftsman. The latter argument is, of course, a good one, and both Mr. Lewis F. Day and Mr. Walter Crane concede this fact. The former says he is not attacking the Arts and Crafts, whose aim is to bring together art and craftsmanship, "but only the policy of those who go beyond that, and argue from the undue subdivisions of labour that there should be no division of work according to capacity." It is admitted on both sides that the combination of design and handicraft has infused new life into commercial crafts that had got deep into "trade ruts." Painting, of course, stands by itself: the work cannot be delegated to other hands, but with a decorator or designer it is not the same. Mr. Crane's view of the ideal way of working in the crafts is the right one—viz., that of the workshop system—"a designer working with assistants whom he trains and inspires, and from whom are developed fresh designers from time to time who learn every detail of the craft. Some crafts depend more upon individual expression than others. Every designer should be able to discover the craft in which he can find himself the most." Of course, the argument used by the advocates of ordinary commercial art is that it is waste of time and energy for a man of invention and design to do the common manual labour which others can do better; but it is contended by the artist-craftsman that brains and hands cannot be separated: "one's brains should be at the ends of the fingers" as well as in the head. The discussion at this point turns on the question of the separation of

brains and hands; one arguing that it is not a device of industrialism, but a work of nature, and the other maintaining that the actual separation of brains and hands in modern manufacture, accompanied with mechanical and trade finish, has been the cause of the decline of art in industry. Designers have not always or often an executive faculty, but they ought to have such a practical grasp of the design as to know how it should be carried out, and the best artists have this dual faculty by being able to realise in concrete form their idea. It is very true that the "trade finish" of the manufacturer is made too much an end by itself, one of the charges the late Mr. Morris brought against art of this sort: highly polished surfaces of metal and glass, smoothness and evenness in brickwork, mechanical division, as in jointing and ornament, are examples of what we mean. The real artist would not care to finish every part of his work to the same degree of excellence; he would make allowance for material, position of the eye, texture, and other points. The question of subdivision of labour has a relation to this subject. The industrial artist must to a large extent depend on subdivision of labour in the production of his design; on the other hand, the artist-craftsman does not say there should be no subdivision of labour, but thinks it should be limited to certain classes of work, or where there is different kinds of mechanical labour. In the workshop system of training the art-craftsman there is room for co-operation, and the designers and craftsmen can differentiate their talents; in fact, there is an opportunity given to each to co-operate in the production. In some crafts, architectural design is one of them, involving repetition and heavy labour, subdivision is necessary; in others—i.e., painting, modelling, metalwork, colouring, &c., the designer and craftsman are better united. The conclusion of this discussion is that the question "depends on the sort of design, how far it is essential that design and execution should be in the same hands." Both the disputants to this question appear to agree that in some crafts, like painting, modelling, metalwork, carving, and many more, the designer should, if possible, be his own executant. That he ought to be in all cases may be a sound theoretical view; but economic conditions render it impossible. If we take only modelling, the two functions design and execution are indissolubly one. The artist who cannot express his idea in modelling, in giving form and solidity to his thoughts, can have very inadequately mastered his theme. He cannot, for instance, realise the light and shade—one of the elements of a group of sculpture or a modelled design, or the effect of perspective. Nor in a design for metalwork can he fairly do justice to the design and detail unless he can give the effect of hammering and texture to the metal. In such a manner did Vischer and his colleagues in German metalwork attain their pre-eminence as craftsmen in bronze, copper, and iron in the fifteenth century. A clever caricature, intended to symbolise the attempt to unite art and industry, called "A Day-sy Chain," embellishes the end of this chapter. "The Artist and His Livelihood" forms the subject of another colloquy; but pressure of space will only permit us here to give briefly the main points of the controversy.

The question is a large one, with many issues. It concerns the present commercial system, which is a fruitful source of controversy. On one side it is alleged against it that it is responsible for our overcrowded market, competition among producers which encourages "insincere and cheap penny productions in art," to use Mr. Walter Crane's phrase; also a narrow kind of specialism into which capable artists are forced in order to live. On the other side these charges are more or less disputed. Both sides agree that competition and overcrowded markets are evils; but it is alleged by the commercial artist

that it is no misfortune to the artist that he has to earn his living. Mr. Walter Crane puts his objection in the right form—that it is the effort to sell that is objectionable, and has no relation to art. "It is rarely that which sells which is nearest to the artist's heart, and therefore it is difficult to be at once commercial and sincere in art." The artist produces for the joy of producing and giving pleasure, not for profit. On the other side, the argument of Mr. L. F. Day is that the artist thus sets up a standard of life and shuns his duty as a citizen. He does not think art gains by repudiating the commercial. There is something to be said on this side of the case; but every man has a right in the community to do the work he is fit for and can do best, not to allow his time and energy to be divided by a desire to get a living. The man who has to study and cater for the market of public taste, or for what pays best, must sacrifice his art. It is also true that the artist who is a specialist, strictly with a view to commercial success, loses in time his power of doing the one thing for which he has equipped himself well. Often a man goes in for a work that pays him best, though his real power is in another direction. Thus, a man who designs wallpapers might do better work in mural painting or stained glass. As "W. C." says, "It is an age of round men in square holes," but the holes are waiting to be filled, and artists are in readiness to rush in. There is little choice—their work is cut out for them as a rule. Supply creates demand, and an artist has to make his living, and he has to design to suit the market. But "the industrial artist" says, opposition to degrading conditions braces the artist; that what is forced upon the unwilling artist under present conditions to make a living improves the artist. We cannot expect ideal conditions, and therefore our efforts to do the best is good for both; the necessity of earning a living is said to be a good thing for the artist. So this long discussion proceeds. One of the combatants argues we are living in a vitiated atmosphere, our conditions are not favourable to art, and the true artist, if he is honest to himself, must fail to earn a decent living. On the one side the commercial advocate says the necessity of doing work not in itself attractive makes for character. He denies that a designer must degrade his art or starve;—he can "meet the demands of trade in a way that is not degrading—which makes a better man of him and no worse artist." The disputants "beat about the bush" a great deal; they seem to be discussing the subject from opposite points of view. What are the strict conditions of the artist and commerce? To one they appear degrading to the artist to have to submit to them for the sake of making a marketable article; to the other, they are regarded as meeting wants. Both are agreed that the artist must meet conditions. Then the terms "degrading" and "artists" appear to be viewed differently. To the industrial advocate degradation means working on a lower plane, to the ideal artist doing something to please a vulgar taste or market. The word "artist" is taken to mean the actual artist "as he is" in one sense; the other as the "worker" in art. The conclusion of the discussion appears to be summed up in "W. C.'s" last reply. It is better for all to earn their living, for each to serve the community according to his capacity. "He who lives to please must please to live, and here the unfortunate part of it comes in under present economic conditions as regards the artist: hence insincerity, banality, and pot boilers."

The next colloquy is on Art and Industry, and turns on the question of the division of labour. The advocate of the Arts and Crafts movement asserts that it is one which actually unites the two, that it is an attack upon a commercial or capitalistic

organisation of industry. The other side disputes this statement, and "L. F. D." says, "industry may have gone astray, but yours is not the way to bring it back to the path of art." We have no space to enter into the questions raised, though exceedingly interesting. The advocates of the industrial order of things have little faith in "a handful of independent workers" setting up a new system. On the other side it is admitted that no sudden change of the factory system and machine production for profit into artistic production for use is at all likely, nevertheless, the artist-craftsmen's ideas are influencing industry. "W. C." very truly observes, that to obtain a really artistic thing, however simple, it is necessary to return to handwork. The discussion turns largely on the use of machinery, and how it has benefited trade at the expense of art. While the advocate of industrialism, as it is, regards profit as the main motive of production, the Art Craftsman makes *use* as the chief incentive; but we cannot follow the subject further now. The other discussions, also of much interest deal with "Work and Pleasure," "The Profession of Art," and "Poetic Ornament." We may return to them on another occasion. In the mean time, we may congratulate the authors of "Moot Points" upon their interesting and instructive contribution to the cause of art, and the friendly spirit in which the discussions have been conducted. This work places the general art reader in a position to judge for himself the merits of the two schools which just now divide the artistic world upon the great questions of Commercialism and Craftsmanship.

ON THE PLANNING OF SMALL PUBLIC LIBRARIES.

By A PUBLIC LIBRARIAN.

DURING the months August to November there have been recorded (excluding amounts over £10,000 and under £1,500) gifts from Mr. Carnegie to one hundred localities for the erection of public libraries amounting in all to £380,000, or an average of £3,800 each. It is well known that every large town has now its public library, and, excepting additions to existing buildings, the provision of branches, and, in a very few cases, the erection of a new central library, the designing of public library buildings has of late been—and is likely to be in the future—confined to those of small towns, the cost of which will be from £1,500 to £7,000.

It goes without saying that the architect's work is governed more or less by local conditions of site, peculiar requirements, &c., nor forgetting the fact that the constitutional prejudice of Councillor Sloman, of Muddleton Magna, rules out anything that has not been tried at Puddleton Parva, his native place, and in whose library he first acquired a love of reading.

It is impossible to dogmatise on the planning of a public library; in fact, this paper would be unnecessary if the architect had the benefit of an hour's discussion with a trained librarian who was alive to the special local needs and modern developments of library practice; but in the preliminary arrangements the schedule of accommodation is too often drafted by the members of the council, with, perhaps, the assistance of the borough surveyor, after paying a visit to two or three libraries in their vicinity.

Before an architect can successfully plan a public library he must know something of its economy, and this knowledge can only be obtained of a librarian. One of the most important considerations is, strange to say, invariably lost sight of by architects. Designs for a public library to cost, say, £6,000 are invited. The architect finds on inquiry that the population of the town is, say, 40,000, and that there are 5,000 volumes in the exist-

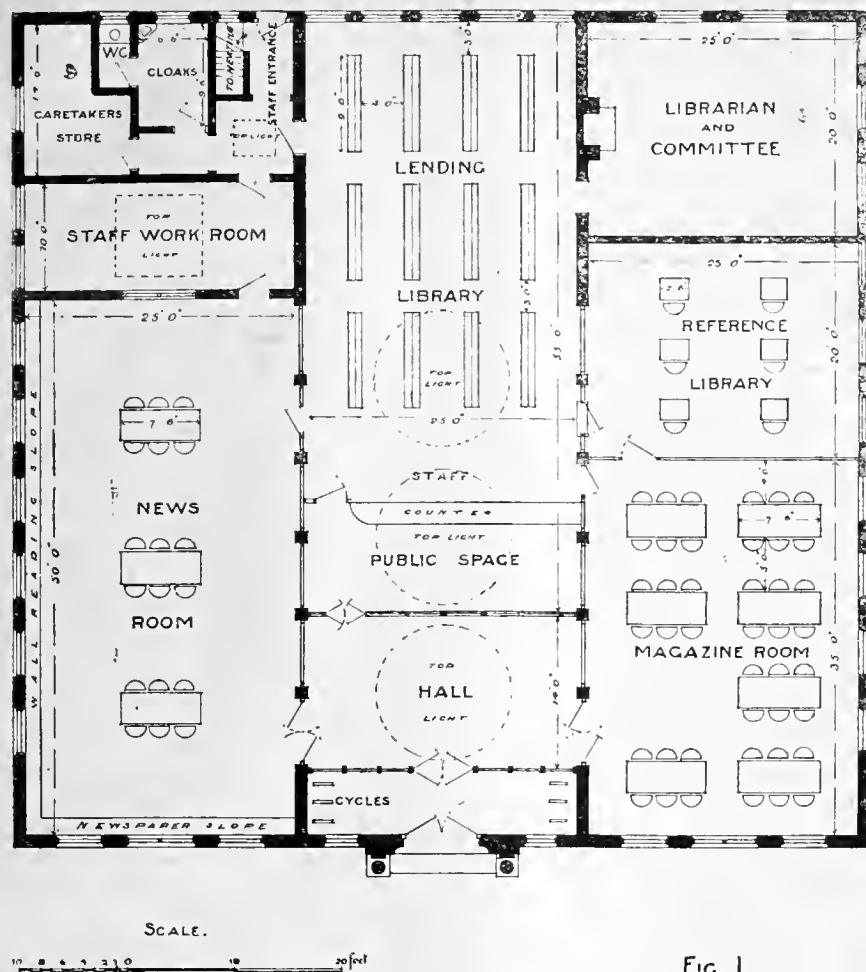


FIG. 1

ing building, the annual issue of books being about 50,000. Thinking the arrangements of libraries four times the size will be of little or no help to him, he selects three towns with about the same population, so that he may see the actual working of such a library as is likely to be required. The library rate of 1d. in the £ in those towns he selects may produce, say, (A) £400; (B) £800; (C) £1,200; owing to differences in the local rateable values. This question of income is of very great importance, as it generally makes a difference in the composition of the library staff.

Let us take for illustration three places about to erect a public library. If some seemingly superfluous matters are dealt with, our excuse is that recent experience in assessing public library designs has shown us that architects have given very little attention to library management. This is seen not so much in their designs as in their inquiries. It must always be kept in mind that we do not draw any hard and fast lines in what follows.

In the first place, we would like to show approximately the probable income and work of the libraries about to be built. The following comparative table is based on an examination of the small libraries now established.

Library to cost in building	£2,000	£4,000	£6,000
Population	8,000	20,000	40,000
Annual income	£140	£400	£550
Volumes in library at opening	500	2,000	5,000
Ultimate maximum number of volumes in lending library	4,000	8,000	12,000
Ultimate maximum number of volumes in reference library	200	500	1,000
Daily issue of books	50	120	200

It is difficult to say how (d) would be staffed, as so much depends on local conditions; but it is almost certain that (r) and (f) would require the same number of

attendants, therefore if (c) pays say £200 in salaries and wages out of a total income of £400, there is considerably more money at (f's) disposal for books, newspapers, and reviews. This affects the accommodation required. These are points to be considered at the present time, as the prospect of localities taxing themselves to maintain libraries adequately is still very remote.

The nature of the site must, of course, largely affect the design; but in the case of the libraries now under consideration, the site seldom causes any difficulty, as open spaces need not be so jealously guarded as in the larger towns.

Fig. 1 is by no means intended as a finished plan, but merely to indicate the accommodation required in a library costing £6,000.

The lending library is arranged on the ordinary method of service with an "indicator" on the counter, but should it be decided to adopt the "open access" system, a system more likely to be generally adopted as its advantages become more known, it would only be necessary to utilise the space now given to the public, and to place three book stacks where there are now four, the three displaced coming forward. It is of the greatest importance that all shelves should be of the same length, so that they may be interchangeable throughout. The shelves should, of course, be adjustable, either by means of the well-known Tonks fittings, or some other mechanical contrivance. In estimating the storage capacity of the library, allow eight shelves to each standard stack 7ft. 6in. high (never higher), and ten volumes per lineal foot. This is a very slight over-estimate, but it is practical and near enough, unless the library has already a large collection of old quartos and folios.

Many libraries now organise courses of lectures, and this tendency to link the public library to such movements as University Extension, National Home Reading Union, &c., is growing; and as it would be very

wasteful to build a special lecture-hall, it is advisable to provide roller shutters to cut off the magazine and reference room from the rest of the library when these rooms have been temporarily converted into a lecture-room or classroom. The news-room is large enough to take the displaced furniture during the lecture. The staff workroom is a great convenience for repairing books, filing papers, unpacking cases, &c. The floors of all public rooms should be laid with hard-wood blocks

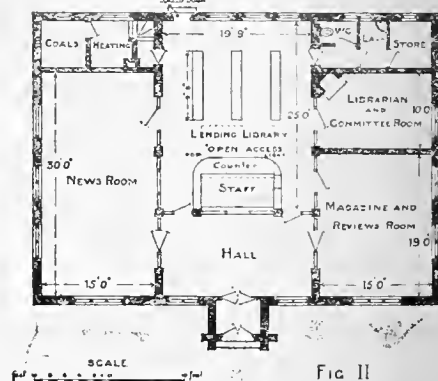


FIG. 2

and the hall with mosaic. Tiles are too noisy for a library. Glass screens should be used to separate rooms, so as to facilitate oversight. If it is possible to obtain a supply of electricity for lighting, this method of lighting must be adopted, as it is the only satisfactory one. Gas ruins the bindings of the books, and vitiates the air. The extra cost of electricity is balanced by the saving in cleaning and rebinding.

Ventilation still seems to baffle all architects, as a visit to any public news-room on a damp muggy day will prove. The fresh air inlets should be arranged near radiators, and wherever possible (particularly in the poorer districts) an electric fan should be placed in the roof of the news-room.

Newspapers are better on wall slopes than on detached reading desks, as they distribute the readers and admit of easier supervision. Another small matter, but one that largely affects the work of the staff, is the provision of back or side doors to allow the carrying of books to the open for dusting. This necessary work goes on throughout the year, and is often hampered for want of convenient side doors.

The designing of branch libraries need not differ materially from that of any small town library, save in respect to the storage of books. No branch need house more than 10,000 volumes; in fact, 5,000 should be nearer the number stored, as books not frequently called for should be either discarded or transferred to the central library. It will be noticed that neither special room for ladies has been provided, nor public lavatory. The latter is really unnecessary, and where it has been provided has proved an abomination. As to the former, it seems somewhat surprising that the thought of providing such a room should ever be entertained. The sexes mix in church, in the theatre, in museums and art galleries, therefore there is no logical reason for separation in the public library. A more cogent reason for not having such a room is that a library should be, as far as ever possible, educational, and the provision of such papers as those specially published for women should certainly be reduced to a minimum in an educational institution, and it is impossible and unnecessary to supply duplicates of the standard periodicals.

Now, with regard to libraries costing £4,000 and £2,000 (the sketch herewith shows what is likely to be required in a library costing £2,000), with a normal income, and after what has been said, it seems unnecessary to give a middle sketch, as something between the two will meet most cases.

Local committees generally wish to make the reading-rooms of small libraries look comfortable by providing open fires, and in this matter architects seldom go against the wishes of their clients, as this method of heating offers more opportunities for pleasing effect than an arrangement of hot-water pipes. The open fires cannot be too strongly condemned, as they cause infinite dirt, and their heating powers are satisfactory only to those genteel and other loafers who think "self's the man." An open fire may be provided in the librarian's room and the staff workroom, but the whole of the library should be heated with radiators on the low-pressure hot-water system.

Whatever style may be adopted for the elevation, ample natural light should be admitted. The mental impression made on the reader by the stones may be more elevating than that he receives from his reading, but a style of architecture shutting out the daylight from a public library is bad.

RATING.*

THE principles and practice of Rating, from the surveyor's standpoint, have not received the attention their importance deserve, and we therefore welcome the bulky volume on the subject, by Mr. Philip Michael Faraday, Rating Surveyor, which presents the subject clearly and intelligibly to practical men and others. The principles which underlie rating assessment are divided from the practice or form which they take before rating authorities, a plan which has many advantages. The new edition (this being the second) has been considerably enlarged, and several important legal decisions have been embodied. The recommendations of the Royal Commission on Local Taxation are not likely soon to become law, and perhaps this is not regrettable, though the evidence given is of great value, and should lead to many reforms in practical procedure. The author has been assisted by Mr. A. F. Vulliamy (a solicitor of the Supreme Court, and many years clerk to the Guardians of the Ipswich Union and to their Assessment Committee), who has edited the legal part of the work. The principles of Rating form Part I. of the book, and six chapters are devoted to their exposition. As our readers may not be aware, the foundation of the present law of rating dates from an Act 43 Elizabeth c. 2, which gave power to the parishioners to elect a certain number of householders in that parish, and, "together with the churchwardens of that parish, they shall become the guardians of the poor." There are many exemptions by statute and common law: such as all Crown property, palaces, galls, post-offices, barracks, volunteer storehouses, drill-halls, bridges in occupation of the Crown, police-stations, courts of law, churches and chapels, literary societies, public libraries, parks, &c. Chapter III. deals with Occupation, an important point as to the question, Who is liable to be assessed to the Poor Rate? It matters little under what tenure the property is held so that there is an occupation. Possession does not necessarily imply occupation, and in the case of "R. v. St. Pancras," Lush, J., said: "Occupation includes possession as its primary element, but it also includes something more. Legal possession does not of itself constitute an occupation. The owner of a vacant house is in possession, and may maintain trespass against anyone who invades it; but as long as he leaves it vacant he is not rateable for it as an occupier." There must also be exclusive occupation to become liable to be rated to the Poor Rate; an ease-

ment is not rateable, and as in the case of "Smith v. Lambeth Assessment Committee" bookstalls on the platform of a railway station were held not rateable, as there was no exclusive occupation of the newsagent of any portion of the platforms; but the bookstall, enhancing the value of the station, renders the railway company liable. This rating was confirmed in other cases, as when stables were let within the railway company's premises and the company were held rateable. Many important instances are cited. Lodgers are not considered occupiers, for a lodger occupies only a portion of a house, and has not exclusive occupation. (See "Allan v. Liverpool.") "In the case of a lodger his occupation is more in the nature of a guest at an hotel: his rooms are entered by the landlord for the purpose of keeping them clean and in order, &c.; he uses the same staircase, and his apartments are under the control of the landlord. This cannot be called exclusive occupation which would make him personally liable to be rated for that portion of a house used by him." Cockburn, C.J., made the occupation to depend on "whether the landlord retains the control of the outer door." The case is altered when the house is divided, the upper half let to one tenant and the lower half to another. Lord Esher gave a sound judgment in this instance. It was argued that because there is no structural division of the house, the occupation of each part of the house is to be treated as a joint occupation; but this was not upheld. The judge contended that the occupation must be dealt with. Each of these persons occupies rooms in one floor of the house, and occupies them separately. Nobody else has a right to interfere with his occupation of that part, and they are each to be rated in respect of their occupation. It is a misuse of terms to say they jointly occupy this house. Each man or lodger occupies something, and whatever you may call it he is liable to be rated. The question of flats and chambers is of interest. In the case of "R. v. St. George's Union," where the blocks were structurally divided into 117 different sets of rooms, and capable of being let and occupied separately as residences or offices, Cockburn argued that every one of the occupiers of these distinct tenements (117 in number) is rateable to the Poor Rate, and to other rates to which occupiers are liable. Other interesting instances are given. The phrases, "gross value" and "rateable value," are defined. The method of taxation was very irregular at first: there was no uniform rule for levying the rate, the overseer had to make the assessment, without any guide as to the capabilities of the ratepayer. In 1743 the churchwardens and overseers had unlimited power, and often misused their authority, and the Poor Rate Act of that year met this evil. Many doubts arose about the meaning of the terms "gross value" and "rateable value." They were defined by the Valuation (Metropolis) Act, 1869, the former as the "annual rent which a tenant might reasonably be expected, taking one year with another, to pay for an hereditament if the tenant undertook to pay all usual tenant's rates and taxes, and tithe commutation rentcharge, if any; and if the landlord undertook to bear the cost of the repairs, insurance, and other repairs, if any, necessary to maintain the property in a state to command that rent"; and the latter term, "the rateable value of any property as the gross value, after deducting from it the probable annual average cost of repairs, insurance, and other expenses, if any, necessary to maintain the property in a state to command the rent." These definitions are in force at the present time. The author justly remarks: "There is, no doubt, some modification required in the definition of 'gross value,' as in the year 1891, when the Tithe Act came into operation, it was enacted that the landlord, and not the tenant, should pay

the tithe; whereas it is assumed in the definition that the tenant pays it. The consequence is that a landlord who formerly received a rent from a tenant, who himself paid the tithe, now has to increase his rent to a figure which will leave him, by way of profit, the same amount as before. The result will be seen at once—the former rateable value will remain the same, because, as the tithe is rateable, the landlord pays the rates on it, and in the event of the rateability of the property being increased, owing to the raising of the rent through the circumstance stated above, not only will the landlord pay the rates on the tithe, but the tenant also, an injustice which cannot have been contemplated by Parliament when passing the Act." Of course, present value must always be the basis upon which a property is to be assessed. In London the valuation list is made once in five years, and for practical purposes this is sufficient, as the fluctuation in value does not occur often, except, perhaps, in case of companies.

The chapter dealing with public companies discusses the principles of rating as applied to these bodies. To find out the rental value of a company is difficult. A powerful company can effectually resist the claims of a poor parish. The basis of assessment must be the receipts and expenses. In arriving at a fair and equitable figure, the rental value of the land occupied by a company has to be found, and this can only be done by examining the accounts of the company. When the company's land extends over several parishes, it is assessed at so much for each. The principles of rating as applied to canals, to railways, gas and water companies, tramway companies, telephone and electric light companies, &c., are also discussed. One question has been to determine the principle of assessment for railways: the parochial principle is the one adopted in making a valuation; the other principle is based on mileage. The difficulty of applying the parochial principle to a gas or water company is pointed out by means of diagrams. A railway or tramway company earns money in every parish it passes through, irrespective of when the money is collected at a station beyond; but with a gas company which makes "the gas at the works A, conveys it through a parish C, and sells it to a consumer beyond at B, it is at B the money is earned, and the parish authorities of C can only assess the main in their parish in a percentage upon the structural value of that main." In a third case, when the gas is conveyed from works A through mains to parishes C and B, it is shown that the intermediate parish C has two sets of mains, one supplying the consumers in that parish, another set carrying the gas beyond to parish B. These two sets of mains, "live" and "dead," have to be rated separately. In practice the valuation is made of the whole undertaking, deducting the value of the "dead" works—i.e., the manufacturing works, dead mains, or reservoirs (whichever it is, gas or water). The value of the dead works and mains is subtracted; the result is the rateable value of the entire live works. Then the actual receipts in the parish in question are obtained, and a simple proportion sum is made thus:—"As the whole receipts are to the rateable value of the whole, so are the receipts in the parish to the rateable value of the parish." A percentage value of the "dead mains" in the parish must be added to make the valuation complete. Each parish must therefore rate the part that lies within it. The same principle of assessment is applied to telephone and electric-light companies. Machinery is the next subject discussed, but we pass on to the practical part of the volume dealing with Buildings. These include houses, small tenements, public houses, schools, shops, theatres, hospitals, convalescent homes, asylums, hotels, &c. We can only dwell here upon

* Rating: Principles, Practice, Procedure. Second Edition. By PHILIP MICHAEL FARADAY, Rating Surveyor; the legal matter revised by A. F. VULLIAMY, a Solicitor of the Supreme Court. London: Estates Gazette, Ltd., 6, St. Bride-street; Sweet and Maxwell, Ltd., 3, Chancery-lane.

houses as the most frequent description of property, and we may refer to the third schedule of the Valuation (Metropolis) Act, 1869, where there is a maximum rate of deduction from the gross value or rental value to arrive at the rateable value. Three classes of houses and buildings are liable to Inhabited House Duty, and those, with the reductions allowed by the Act are worth giving for reference. Class I. comprises houses and buildings, or either of them, without land other than gardens when the gross value is under £20. For these the maximum rate of deductions per cent. is 25 or one-fourth; Class II., ditto, ditto, when the gross value is £20 and under £40, 20 or one-fifth; Class III., ditto, ditto, when the gross value is £40 or upwards, 16²/₃ or one-sixth. The most simple case of assessment is when a tenant occupies a dwelling-house at a rent of £19, the landlord doing the repairs and paying the insurance: in this case the gross value would be £19. Then under this schedule Class I., the maximum deduction must not be more than £4 15s. This would be £4 10s. for the repair and renewal fund and 5s. for insurance, leaving £14 5s. rateable value. If the tenant paid all the repairs and insurance expenses, the rateable value would be the rent actually paid, £19, less a small amount for sinking fund. In another instance, if a tenant takes a house at a yearly rental of £39, the landlord doing repairs and paying insurance; from the gross rent would be deducted under the schedule Class II., one-fifth, or £7 16s., leaving £31 4s. rateable value. Other examples are given, where the tenant undertakes the repairs, and a concise rule is given to ascertain the rateable value, which, with the aid of the tables given for Classes I. and II., will enable anyone to find the rateable value. But the subject is too large to consider here in its various bearings, and we may leave the volume at this point, hoping to refer to other classes of buildings mentioned. Mr. Faraday has given us a very useful and comprehensive handbook, with complete tables of cases, with chapters on the procedure inside and outside the Metropolitan area, with forms and appendices of the leading Acts of Parliament relating to the subject.

THE ARCHITECTURAL ASSOCIATION.

THE sixth ordinary meeting for the present session was held at 9, Conduit-street, W., on Friday evening, Mr. Arnold B. Mitchell, B.A., Vice-President, in the chair. Messrs. A. W. Wilson, C. W. Bury, H. J. West, H. Bromley, and R. Welford were elected as members. The chairman announced the following additions to the New Premises Fund:—Messrs. Farmer and Brindley, £10 10s.; Mr. T. E. Pryce, £10 10s.; and Mr. E. R. Howard, 10s. 6d. Mr. Louis Ambler, hon. secretary, stated that a joint meeting of the Discussion Section and the Camera and Cycle Section would be held on Wednesday, January 6, at 7.30 p.m., when Mr. F. Lishman would read a paper on "Sketching from an Architectural Point of View," and Mr. Gilbert H. Lovegrove would read one on "Photography." He also announced that the following classes were about to commence:—Jan. 6, Elementary Physics, Div. I., lecturer Mr. H. B. Ransom; Jan. 7, Drainage and Water Supply, Div. II., Mr. Max Clarke; Jan. 13, Ornament and Colour Decoration, Mr. Cole A. Adams; and Jan. 14 Greek and Roman, Div. I., Mr. Hugh Stannus.

OLD STUCCO-DURO AND PLASTER WORK WITH REFERENCE TO MODERN USE AND APPLICATION.

A paper on this subject was read by Mr. G. P. BANKART. The very commonness of the material, its cheapness, and facility of manipulation are, he remarked, at one and the same time the virtue and the misfortune of plaster. It combines extreme ease of manipulation with great durability. To no other material do the associations of our daily lives cling more closely than to the plaster with which the very walls and ceilings of our homesteads are covered. It is this very serviceableness, this very commonness, which may

make it worth the while of some of us to pause over, to consider what has been done with it—what is being done with it—what may be done with it—what are its possibilities and limitations as a material. It is intensely sympathetic, a medium which has been used by some of the world's greatest artists of all times but the present, and yet of all the materials in the employment of men few, if any, have been subjected to greater vulgarity of treatment than the plaster of the last century. It can be modelled, it can be cast or incised, coloured, stencilled, or stamped with equal freedom, from the size of a cameo to the vastness of a dome. It may be set as a jewel or applied to the façade of a palace. We propose to treat on some of the methods of working it when it was an art in order that we may better realise its capabilities and limitations for the present and the future. Having sketched in some detail the historical use of stucco, Mr. Bankart pointed out that plaster was a much more recent invention.

ITALIAN WORKERS IN ENGLAND.

The introduction of Italian workmanship into England in the reign of Henry VIII. was followed by the raising of a school of English craftsmanship which rapidly spread the art throughout the country. But stucco-duro gradually gave way to the employment of coarser stuff or "parget" work, which became rather later the medium of the native workmen. About 1547 we have record of an English stuccoist named Chas. Williams, who had travelled in Italy, and probably was the first to work in England and at Nonesuch. Time went on, and a cheaper and commoner material brought "degeneration" with it—of a kind. This coarser stuff was modelled and stamped, and was known as "pargetting," and consisted of the ordinary lime, hair, sand, and was applied to any part of the structure, internal and external. Then followed

THE WAVE OF PLASTER WORK,

particularly our own:—1. The arrangement of panelling and radiating ribs based on the fan tracery of stone. 2. A pendentive system superseded and outlived the above, as at Andley End, in the "Fish Room." 3. Modelled foliage sometimes replaced the radial ribs, giving effect of Gothic diaper. 4. Pendentive system superseded by geometrical arrangement of ribs—not limited to straight lines, ceilings abounding in interlacing lozenges, quatrefoils, circles, ovals, and other forms, spaces between ribs being filled with armorial bearings and personal devices and other emblematical forms; figures very seldom, unless of armorial character. (5) Size of sub-division gradually expanded until (6) Ceiling area became divided into four parts large or small, quarter bearing the design. This developed into

THE JACOBINE SYSTEM

of interlacing strapwork and patterns. Earlier ceilings had plain moulded ribs—like groin ribs. As power of execution grew flat surfaces became introduced between two sets of mouldings, with improved decorations done off a revolving stamp. Queen Bess's time had moulded ribs, with sprays or sprigs of flowers or medallions of floral ornament. These ribs or medallions were cast or run *in situ*. Sprays and medallions in early days were nearly always modelled by hand. Afterwards stamped; later still, cast in plaster of Paris. Sometimes sprigs were butter-pressed. In later years, methods were almost exclusively confined to casting in plaster of Paris. This system was productive of a beautiful softness and dulness suitable to the material, and was quickly done compared with earlier methods, and stucco-work, and less expensive. Against this one has to put the sacrifice of intellectual effort on the part of the worker.

WHAT DO WE LEARN FROM THE OLD WORK?

The plaster is widely different from ours. Examine a piece of old plaster. It is coarse and rough, and contains little bits of gravel and other inequalities which modern architects would condemn without doubt. Where should we draw the line? The old ceilings were not die-level and polished: they were full of delightful, but very slight, undulations; the ribs and strapwork were not painfully exact, as ours are. The old work lacks that strain and mental limit naturally associated with office confinement, and the ever continual abuse of drawing as an art instead of a means to an end. Hand and eye judgment, rather than exact measurement, was evident everywhere. Moulds were carried from one job to another, and frequently made to fit in as they would, or were

altered to suit circumstances. The workmen had their moulds, tools, and traditions—perhaps some rough plan for guidance, instead of a fussy and pretty drawing of what it would not, and could not, look like—to tempt and deceive a client. All sorts of funny things occurred, quips and cranks and things attributed by some to the genius of the age, and which were very possibly due to accident. Ornament designed and worked for a ceiling will be found combined with another, and used as a frieze elsewhere, or into an interlacing pattern in some lunette. All sorts of things done for one, or several places, are combined in an overmantel or wall space between dado and ceiling. Much modelling was done with metal tools, and sometimes with the fingers and hand. The lime must have been in a very different condition when used in those days to what it is now, or men's fingers could never have worked it! In many ways their methods of procedure were different from ours—more intellectual, less mechanical. Think of the many quaint patterns done on the outsides of buildings (cottages and houses) by the common village plasterer or mason, with the pointed "fan" of sticks, still used by our own plasterers for "pricking-up," as they term it. Think of the quaint patterns done with end of the trowel in various ways. These patterns are confined to the particular district radius in which the man lived and worked. Some of this "pargetting" work is not only clever, but complicated, in the arrangement of symmetrical, flat, strapwork patterns, in panels sometimes, at other times over the whole surface of a wall. Some of this work is suggestive of natural form, and it is here interesting to note how the influence of Nature affected this art when first introduced into England. At that time the stucco-worker undoubtedly went to Nature for inspiration, as is evidenced by the friezes at Hardwick Hall, St. Michael's Mount, and other places. This may have been because the art was new, and then had no traditions which could be followed.

SUGGESTION V. REALISM.

The plasterers' craft did not share the fate of the other crafts, whose traditions were paralysed and crushed out at the time of the great upheaval in Henry VIII.'s reign. On the other hand, it was inspired with a new use, a new life, a new purpose, and was developed with a vigour and freedom strongly akin at times to the wonderful work at Venice and the Early Gothic work. Take, for instance, one example only—the Long Gallery ceiling at Knowle, Kent, in which are combined the vine, rose, pink, honeysuckle, columbine, marigold, lily, oak, &c., &c. These flowers occupy spaces formed by waving bands of enrichment, and are modelled quite as admirably as such dull material as plaster can, or ought to, be modelled. It is very simple, broad, big, straightforward work, free in every way, has little variety of relief; the line curvature is gentle and refined, although vigorous. There are no sharp curves, no under-cuttings, or "sparkle" of effect that might be appropriate and desirable in a harder material, such as stucco, or wood, or marble, but it has a dulness and a softness quite natural in such a medium. There is no attempt to "copy" Nature, but only to give so much of her as would express the vital quality, freshness, and vigour of growth, combined with fulness and convenience of arrangement and disposition. "Realism" was admittedly beyond the limits of plaster, unnecessary, and even undesirable. With such limited means at hand the plasterer contented himself, and rightly so, too, with a mere suggestion of Nature, and compromised matters between his material and the suitability of his design to the material. Simplicity, breadth, reticence, were his watchwords, and sincerity of purpose his most faithful companion. The contrast between the past and the present is sufficiently palpable. We are now chiefly concerned with what is open to us at the present time, and this brings with it various little difficulties. Being myself an architect as well as a craftsman, I am in a position to realise both sides of the question. We cannot, if we would, get away from the employment of plaster as a material. We, therefore, are confronted with the question of what can or should, or what cannot or should not, be done with plaster work. What are its capabilities and limitations as a material? Craft degradation has gone so far that what is called "painted decoration" is done by "firms" to the order of members of our profession. Wherever handicraft has not been intercepted from material by the intervention of a learned profession, work is still as perfectly beautiful as

ever it was, be it in the windmills of the millwright, the fishing-smacks of the shipwright, or the wains of the waggon-builder—romantic with quaint chamferings, gay with bright paint. What we want are housewrights, and let who will play at examination in the art of passing examinations. Such a sympathetic and sensitive medium as plaster can be used rightly or wrongly, and from its fatal facility of handling the latter course is the more easy, and, from long habit, the more likely to be expected and the more usually demanded. We are all familiar with the modern "sugar"-confectionery of the plasterer. At the present day we have the same materials open to us as before, viz., stucco-duro—ordinary lime and sand plaster and plaster of Paris—not to mention cements of various kinds. The controlling elements are, first of all, cost, which is naturally a wise and binding consideration. Then, clients' idiosyncrasies, architects' ideals, and craftsmen's individualities—sometimes all combined! The employment of "stucco" goes hand-in-hand with freedom of thought and handling, which none can dispute. The idiosyncrasy of clients, where architects are not strong enough to influence them for the better, is hopeless and fatal. Architects' ideals are often possible, with the exercise of freedom and of individuality on the part of the craftsman, when he is a genuine craftsman.

THE CRAFTSMAN'S SYMPATHETIC HANDLING

is the last, and perhaps most hopeful, means of success, where such individuality is strong, unaffected, and reliable. Everything depends on his knowledge of, and sympathy with, architecture, his knowledge of past methods and forms; his knowledge of his material, its capabilities, and limitations; his power of imagination; his grasp of the teaching of nature; his gift of selection, and of the power of expressing himself; and his constructive instinct. Granted a full share of these qualifications, there is little to fear so far as he is allowed a reasonable amount of freedom. And here lies the hinge of the matter—a subtle hinge, to be opened and closed at will by the architect and by the client. Putting "stucco-duro" aside as undoubtedly the finest and most permanent, though more expensive, method of expression, let us resort to less expensive ones. We next have a system of modelling in clay and casting in plaster of Paris, sulphate of lime, from plaster moulds, as the case may be—either solid or fibrous. Here the craftsman has a fair chance of various nice treatments, in the placing of his enrichment, and the relief of his enrichment, according to the funds at his disposal and the liberty allowed (either of restraint or otherwise). In such manner beams may be clothed, flat spaces treated as flat spaces, with flat or projecting bands of soft enrichment in endless ways. I do not consider deeply undercut enrichment cast in plaster of Paris from gelatine moulds a practice to be encouraged. Beautiful as it is in stucco—which is a very hard material as well as a subtle one, allowing of crispness, thinness, deep modelling, and undercut relief, with beauty of texture and every other possibility—it is not a legitimate one for a soft material that is easily rubbed and broken, and will not take sharpness of treatment without injury. I admit the beauty of this type of work; but it is illegitimate, too easily injured, and unsuitable to the material. This work, of course, has to be cast in fibrous plaster, about which there appears to be much difference of opinion.

FIBROUS PLASTER,

although a modern process in this country, is by no means a modern process in itself, and many architects and craftsmen are prejudiced against it as being (1) not strictly a solid plaster process, and (2), as some imagine, not a permanent process. The first objection is a matter open to discussion for and against. The latter objection will hardly hold good, since the process appears to date back to the Egyptian Pyramids, when the mummies were wrapped up in canvas dipped in burnt gypsum. The process was introduced in England in 1859-60 from France, by a Frenchman named De Sachy. His system was to dip small pieces of canvas, about 4in. square, into the plaster of Paris, and dab them all over the mould and over each other. He employed girls in this work, but was not successful in making much of it then. In 1861 De Sachy sold the patent to Messrs. Geo. Jackson and Sons, with Mr. McDonald as foreman and instructor. But at that time little headway was made with it, and the patent was not

renewed. Smaller firms experimented with it from time to time, until it became more constructive and improved. The French used tow in the loose form, instead of the woven and open-sheet form as at the present time, with wood laths in the form of "strutting." A well-known artist told me that he disliked the system owing to having put up a ceiling thirty years ago which had rotted, and had to be taken down again. This was undoubtedly due to the use of boiled plaster instead of baked or burnt plaster. The difference in the two plasters is great, the former being soft and the latter hard. My objection to

"GELLY" MOULDING AND CASTING,

and Piece Moulding and Waste Moulding, apart from its cost, is—First, that it is an apology and cheap substitute for the work of another material—that of "stucco-duro," which would be woven into a gossamer of loveliness; second, that in the system of casting from gelatine moulds the work degenerates rapidly from the moment the model leaves the modeller's fingers. The system is unsatisfactory to begin with. The clay has to be coated with shellac instead of being cast direct from the actual clay surface. In the process of making a plaster case to receive the gelatine a layer of paper has to be laid over the modelling and a thin layer of clay over that, in the process of which the sharp edges and arrises (legitimate in a hard material, which is not afterwards touched) become doubled with the pressure of the clay, and the damage is completed afterwards by putting the gelatine out of the soft plaster casting, which must perforce suffer where fine edges exist. Apart from this, the gelatine deteriorates with every casting taken, and is greatly affected by the variation of temperature, becomes "woolly," distorted at times, and very difficult to manage, and when done is not, and cannot be, that which it is supposed to "ape," and can never take the place of stucco and its endless possibilities.

ORDINARY PLASTERWORK.

Then comes the method of dealing with the ordinary lime, sand, and hair plaster. Why should we architects allow this beautiful material to be smoother and polished up, as we so commonly know it? Why not demand of the plasterer the surface most natural to it—its own granular surface? A few words about this ordinary material, and what can be done with it in lieu of the cast work. To begin with, it is capable of being stamped, and modelled, and floated in bands, and "run," and stencilled through perforated wooden templates. The stamping process is delicious; so is the modelling when treated with breadth and simplicity. With regard to the "running" of plaster-mouldings, we are again to blame in allowing the mechanical, die-level, sharp-arrised process. It is wrong in principle, whilst we can get interesting work out of simple sections made up of soft, rounded, and wave-like forms, flat, undulating, segmental or subtle lines, natural to the "dragging" of a granular material. Again, why the inevitable and hackneyed moulded cornice across the angle of wall and ceiling? One way of avoiding the rigidity of this method of "running" where mouldings are desirable is in the working of a short piece in clay which can be slightly worked on with the fingers, and afterwards produced by casting. Of course, it is possible to work the plaster with the fingers, if the lime is old enough and sufficiently deadened, but not under present circumstances of "running" lime as it is required. Otherwise, no man's fingers could stand it! In the old work, simplicity and bigness will be found to be the root of much of its success. So, also, it must be with good modern work. I have heard it protested that simplicity is synonymous with "poverty." It may be so in some cases, where reticence and breadth are misunderstood, and texture and quality of material are lost sight of, or play a subordinate part. We have good materials at the present day, capable of good treatment. Unfortunately, the art of working them has long since been divorced from craft work, and the plasterers' craft is practically a thing of the past.

DESIGNING IN PLASTER.

Designer and worker are two distinct creatures—the one not knowing the nature of the material, the other not knowing the nature of the man whose work he is supposed to put into material, and trying to do it with a mechanical skill truly appalling in the finished result. In a material such as plaster, designer and worker should properly be one and the same person, and he must be well alive to the possibilities of his material

before he can know how to use them to advantage in a decorative sense. The strain, ever constant, of preventing the operator from obliterating the work of the thinker is horrible. If we can get a certain amount of rhythm or harmony into our work, it will be something, at least interesting—possibly mistaken—if even dull, awkward, or clumsy. Dullness is, in fact, an acceptable quality for plaster. It shows the process of workmanship, and is the natural effect of adding and pressing a soft material on to a surface of similar nature. This feeling is particularly desirable in the treatment of large, plain surfaces. You will say it will be a long time before we can expect anything different from what we are now getting from the modern journeyman plasterer. Possibly so. Possibly as long as until architects insist on having something less laboured. The remedy is not beyond us if we will undeceive ourselves, and admit other facts which I will refer to in a few moments. The kernel of the matter lies in the gulf separating designer and operator. The system is at fault, but time seems to produce reaction upon reaction, and gives some hope. This brings us to another point, and not altogether an unimportant one, and a rather delicate one, which reflects to a certain extent on our educational system and schools. Modern architects appear to be divided into two distinct schools of thought and action—the one engaged in the copying and rearrangement of the forms and lines of past styles, the other in the arrangement and the development of forms based almost entirely on simple and natural construction of materials to suit modern purposes, according to modern methods and requirements. It is a great art to be able to draw well, but it is not "design"—and it is a great gift to possess the art of "design." But before we can design naturally and beautifully in any material we must be familiar with the capabilities of the same, have served an apprenticeship with the works of the past, have held constant intercourse with them, and gather from them how and why many things were done. We must also be in touch with Nature, and pick up from her all that which is good and necessary for our refinement, our delight, and inspiration. The intensity of our art must be in accordance with the intensity of our interest in the creation around us generally—in construction, and in our broad grasp of the whole art of building, past and present. Design is the expression of this delight and interest, conveyed in a harmonious manner according to the limitations of the materials dealt with. But what of the delicate matter we are all of us so apt to overlook and trip-up over—I mean the gift of selection and discretion dividing man from man or uniting them, which passes under the name of "individuality," if there be such a thing! It is not my province to-night to open up

THE QUESTION OF DESIGN,

but I believe much more might be done than is being done in the nice management of straight lines, and slight curvature, rather than the orthodox late 19th century "School of Art Curve" we see so much of—the very curse of the age, born of drawing-paper conceptions and lack of thought in material. All the crafts must draw blood from the ranks of architects to bring about a thoroughly healthy condition, and that there will be a time when architects' work will be less minutely detailed in offices than now, and the working-out of things done by sympathetic groups or amalgamations of workers where architects and craftsmen co-operate and work in a concord and unity, when every man who transfers his attention to craft work will be regarded as a distinct gain to the art of building, and to (what we now call) the "architectural profession." There is plenty of scope for such men; plenty of demand for such good work as the value of their previous office training can add to technical manipulation. Each individual is as much responsible to himself as to the public for his actions in the encouragement or the discouragement of personal craftsmanship as are the general mass of architects, and on individual effort depends the future of craftsmanship; and, furthermore, the art of building will more nearly approach its long-past state of vitality, will again be endued with a new hope, a new life, a new vigour, and a real and living purpose when men of refinement, intellect, and discretion draft themselves from the practice of paper architecture into craftsmanship—when architects become craftsmen and craftsmen architects.

ARCHITECTS AND CRAFTSMEN.

At the present day the relationship between

the architect and the craftsman is rather curious. In the anxiety to please one's clients, and to increase one's business, we are apt to let some things slide, and to do things absolutely against the laws we frame for ourselves and are so determined to renounce. Here it is that little matters crop up which are as disappointing to the craftsman as to the architect. It is sometimes a matter of extreme delicacy, but perhaps not beyond remedy and further resolve. Personally, I have little cause for complaint, and yet I know the evil exists. The relationship between architect and craftsman, one might say, is a matter of influence and sympathy? Not altogether so. It is gradually becoming so, and will ultimately be so; but there are serious drawbacks, where able men are denied opportunities of doing good individual work. I know many such instances. For example, we hear of men deserting "office architecture" for some craft or another, for the good of architects generally and of the building world. Time alone will possibly alter this. It is due in a great measure to the unequal fermentation in the evolution of art matters. It is even necessary in many cases, one would say. There cannot be a cause without effect; but sometimes it has a detrimental effect—an effect which stifles the best intentions of a good workman, extinguishing rather than invigorating. If he is healthy, and strong enough to refuse and withstand this negative influence, all well and good; but there are men of delicately strung fibre who are unable to withstand it, and sink into oblivion through this influence. Their hearts are crushed out of them. Another controlling influence is

THE MATTER OF PRICE.

I say little against it, as it has its good influence in restraint, as also its evil influence in other ways. But it is worthy of consideration, if not of discussion. I know, as an architect, the various causes from which it arises, and how in many cases it might be avoided. Sometimes it arises from the haphazard assessment of prime cost on the part of the architect; sometimes from the unsympathetic, cut-and-dried system of the quantity surveyor, often from necessary economy; sometimes from a desire to get the utmost possible for the client; at other times from an incomplete knowledge of actual working cost of things; sometimes by the unreasonable idea that good work can be done at the price of inferior. A very great deal of disappointment to architect, client, and craftsman might, I think, be averted by a little consultation and consideration of the matter before bills of quantities are issued. It would also be a great help to both parties, and save endless waste of time and energy, if a maximum sum could be named where it is difficult to provide more than very modest means for possible decorative purposes. With a craft such as I have elected to follow there are numerous ways of doing simple work in a quite nice manner with ordinary materials and methods, properly handled, which it would be impossible to indicate on a drawing. You understand me? Matters, merely of texture and handling, only to be realised by a man knowing his material, as an artist knows his paper and colours, and what can be done with them. The architect with much work has not the time, if he would, to acquire all the technical qualities of materials as they present themselves by accident and experience to a craftsman on the look-out, nor has he the same opportunities of rightly knowing the actual working cost of different methods as he who is conversant with them by finger-touch and constant association.

UNDER ESTIMATING PRIME COST.

In conclusion, allow me a few words concerning the actual cost of craftwork and architects' estimates, and prime-cost allowances. I am well aware of the monetary difficulties we, as a rule, have to face in planning out of new building schemes, and I know too well how they often have to be reduced. We sometimes have to cut the coat according to the cloth; but there is one habit some men have, whilst desiring to encourage sympathetic work, which habit seems generally inconsistent—I refer to the matter of under-estimating prime-cost amounts provided for this, that, and the other, including decorative work, of imagining that respectable craft work can be had at the price of "shoddy"—that good work and bad pay are synonymous. The under-estimating of prime-cost amounts must mean one of three things—that either one's client must be asked to spend more than he at first bargained for; or that

the scheme must be reduced; or that the craftsman has to do the work at a personal sacrifice, or at so low a cost as to barely get home over the transaction. Again, one hears the argument that a certain kind of work will not bear more than a certain cost. This is, I believe, an argument based on inexperience, or ignorance of process, and of circumstances controlling it. It is curious that this argument is never applied to the cost of the fabric, or shell of a building, but only to various kinds of craftwork where modest skill is concerned. It should at least bear its own working cost, and a living profit in addition, otherwise, where is the inducement for the good workman or craftsman to excel in his calling? And yet this method of judgment is frequently brought to bear by men who swear by all that is good and true. To compare the relative cost of the two kinds of work is most difficult. Architects who are accustomed to—and only accustomed to—the everyday cut-and-dried stuff, can only estimate for the work they want done by the average cost of the material they have been in the habit of using, and many find a difficulty in estimating for anything different. They will certainly find themselves very much "at sea" if they persist in prime-costing superior work at the same rate they have been in the habit of allowing for inferior work so much in vogue. This system is not likely to encourage "sympathetic" work, and must sooner or later stifle any attempt to elevate craft-workers, no matter what the medium, from unthinking mechanical drudges into intelligent, capable craftsmen, and in the end, men who know better, and desire better, will be compelled to revert to old trade methods and systems which are so offensive to their aesthetic susceptibilities. Boiled down, this all means that the architect must educate, educate, educate his clients, and furthermore must insist upon his own views being carried, even when opposed to those of his client, or otherwise it means grind, grind, grind on every hand as a matter of principle.

A vote of thanks was heartily accorded the lecturer on the motion of Mr. E. GUY DAWBER, seconded by Mr. JOHN D. CRACE, and was briefly acknowledged.

THE SOCIETY OF ARCHITECTS.

THE members of the Society of Architects held their first meeting in their new hall, Staple Inn-buildings South, on Thursday evening in last week, when a discussion took place on the Ancient Lights Bill, which is to be introduced next session, as the outcome of the labours of a joint committee of the Royal Institute of British Architects and the Surveyors' Institution. We dealt in some detail with the measure (which is to be introduced by Mr. Fletcher Moulton, Mr. Haldane, Mr. Robson, Mr. H. D. Greene, and Mr. Herbert Robertson, and which was read a first time last session on June 22nd last) in our issue of July 10 last, p. 35 current volume. The President, Mr. Walter W. Thomas, of Liverpool, occupied the chair. Four nominations were read, and the following six gentlemen were elected as members:—George Hamilton Briggs, 43, Crowther-road, S. Norwood, S.E.; Henry Leon Cabuche, 31, Hamlet Court-road, Westcliff-on-Sea; Morris Jacob Harris, Mafeking, South Africa; William David Jenkins, 12, Frederick-road, Sparkhill, Birmingham; John Stuart McDonald, 8, Esplanade-row, Calcutta; and William Mapp Thompson, Baron Grove, Mitcham.

PRESENTATION OF THE GOLD MEDAL.

THE PRESIDENT said it was his privilege to present for the first time the gold medal which had been offered by the Council to the student who passed with distinction in every division of the society's examinations, and foremost of the candidates who had submitted to the ordeal during the year. This had been gained by Mr. William David Jenkins, of Birmingham, one of the gentlemen whom they had that evening unanimously elected to membership. Mr. Jenkins had served his articles at Llandilo with his father, who, they were gratified to see, was also present that evening, and had since been with a firm of architects at Birmingham. He trusted that Mr. Jenkins would make the honour and welfare of the profession his foremost thought, and that at some future period he would occupy that presidential chair, and be the medium of conferring similar medals on candidates of a later generation. The President then handed the medal, amid hearty applause, to Mr. Jenkins, who suitably acknowledged the gift.

THE PROPOSED ANCIENT LIGHTS BILL.

A discussion upon the value and merits of this measure was opened by Mr. ELLIS MARSLAND, hon. secretary, who remarked that he could not support the proposals put forward; indeed, he objected to them *in toto*. The Bill did not, in his opinion, go nearly far enough, nor was it framed in the right spirit, for it dealt with the question of easements to light as if they ought to continue to exist. He might instance the subject of sky-signs in the Metropolis as an analogous case. A few years since, London was visited by an epidemic of sky-signs, which were speedily recognised to be a nuisance, a disfigurement to our thoroughfares, and to involve some risk to passers by. They were not treated by the Legislature as an easement to be tenderly dealt with, after compensation to the owners, but an edict went forth for their entire abolition after a certain period of grace. The like severe but perfectly fair treatment might very justly be applied to all existing ancient lights. A man who chose to build had no justifiable claim to demand that his neighbours should grant him light over their lands simply because for twenty years they had acquiesced in his so taking his light across their premises or lands. If a man could not obtain his light from within his own curtilage, it was his own fault. Some might think his argument revolutionary, but a similar law to our easements of light did not exist in Scotland, where it was not possible to acquire by efflux of time rights to light over an adjoining building owner's property. If they were to legislate on this question, let the reform be a genuine and salutary one. The Bill should declare that on and after a certain specified date, no rights to light over adjoining property should begin to accrue. As for existing and recognised easements, the same Act should stipulate that after a given number of years—say, twenty—those rights to light should be extinguished. A further radical defect was the proposal to appoint nine gentlemen, appointed to rove from town to town as a peripatetic tribunal. Such a number was poorly inadequate to requirements. It would lead to great delays in the settlement of light claims.

Mr. G. GARD PYE, vice-president, said he could not agree with Mr. Marsland's drastic and, indeed, revolutionary proposals, which he thought would be exceedingly hard on the possessors of ancient light easements. There were, however, several grave objections to the Bill as draughted. There was elaborate machinery provided for the constitution of a tribunal of appeal of nine members—three barristers, three architects, and three surveyors—and after a case had been tried and adjudicated upon by a quorum at heavy cost, the whole matter could be reopened before a Judge of the High Court, where the amount in dispute exceeded £500, and the whole award might be upset on appeal. If a tribunal consisting in equal parts of skilled barristers, architects, and surveyors could not decide a case, all the judges in the land could not arrive at an equitable decision. The judgment of the tribunal ought only to be challenged upon allegations of errors in law or of dishonesty. Another defect in the measure as draughted was that the only bodies recognised by the Bill were the Royal Institute of British Architects and the Surveyors' Institution. Steps should be taken to insure that the Society of Architects, as a growing and important representative body, was also recognised in the measure.

Mr. WALTER C. WILLIAMS observed that the Bill provided certain great advantages as to procedure under the existing law, although there was a great and radical defect in its draughting. It provided in Part III., section 3 (1), that only such light as was "reasonably necessary for comfortable use and enjoyment" could be claimed by a dominant owner; but in every case the settlement of what was a "reasonably necessary" light would prove the most fruitful source of litigation in any dispute. The provision in Part IV. that an obstruction to light could be created by serving a notice on the adjoining owner instead of actually constructing a hideous hoarding, was a very good suggestion; but lawyers and members of the tribunal would, under that section, need to possess a vivid imagination. But a grave defect in the measure was the omission of any penalties for failure on the part of a vendor to disclose that an obstruction to light notice had been served upon him, or as against a lessee who neglected to forward such a notice to his next superior landlord. There were other omissions in this section, and he held that a measure draughted so laxly could

not be, if passed, of any advantage to the public. The chief feature of value in the Bill was the effort made to lessen the amount of expert evidence that could be tendered in an action. All professional men who had had experience in arbitration knew the real value of such testimony, and any proposal which would enable litigants to get rid of expert evidence would tend to cheapen the course of justice. The worst feature of the Bill was the final clause, section 7 in Part VIII., allowing of an appeal to the High Court where the amount awarded exceeded £500 in money, damages, or cost of works. Any arbitrator's award should be final, except in two events—where the arbitrator was mistaken in his law or acted dishonestly. Under the Bill, more paid work would fall to the architect and surveyor, and less would be received by the lawyer; but the client would suffer equally in pocket. The gravest defect in the measure was that it recognised the right to light over another man's land—a principle only sanctioned in England—and that only within the last sixty years or so. The admission of such a right to light was a noxious weed, the growth of modern judge's dicta, and one which ought to be uprooted, whereas the Bill only tried to lop off a few branches, and to cut down some of the rank undergrowth. What was needed was a short Act providing that after a certain specified date no future rights to light should accrue. Any attempt to deal summarily with existing vested interests would wreck the Bill, for all existing rights would assuredly be respected by Parliament.

Mr. R. B. TUCKER supported the views of the last speaker, but regarded Mr. Marsland's suggestions as too revolutionary.

Mr. R. FRANK VALLANCE said that all architects, from a professional standpoint, would regret to see the law of ancient lights abolished, for they provided the profession with much lucrative business. He held that some reform was necessary, but no existing rights ought to be abolished, unless compensation was given to the owners. The best feature of the Bill was Part IV., the proposal to substitute notices of obstruction for disfiguring hoardings.

Mr. C. H. MEAD thought the proposal to refer such cases to two surveyors and a barrister was an excellent feature of the measure; more substantial justice would be done by such a tribunal than by a judge trained only as a lawyer, and probably at a much less cost. Even under the new proposals, a light and air case would, he expected, prove very expensive.

The PRESIDENT referred to what had been done in Liverpool, as demonstrating that in the great majority of cases disputes between a dominant and a servient owner could be settled by friendly conference. A notable fault in the Bill was that the Society of Architects was entirely ignored by its promoters, and he thought steps should be taken to amend this. Apart from this, the Bill, in his opinion, was a most crude and ill-defined one, and needed reconstruction.

Mr. R. W. ROQUES moved that the Society oppose the Bill in Parliament, and employ counsel to protect those interested, and to secure needed amendments of the measure; and, further, that notice of opposition be given to the Royal Institute of British Architects and to the Surveyors' Institution.

The motion was seconded by Mr. GARD PYE, and, having been supported by the PRESIDENT, was carried unanimously.

"THE MANAGEMENT OF DECORATIVE WORK IN PROGRESS."

UPON the management of work in progress must always depend its satisfactory result, not only as work, but as to its profit and the continued good relations between all concerned. As far as I have observed, however, the careful organisation necessary for this is too often wanting, and a great deal of waste occurs through lack of any general scheme of management. As painting is always conducted more or less away from the master's premises, it only too easily happens that, through want of systematic communication, little delays occur, each one possibly very small, but together becoming important, and important in most of all in producing that slight sense of hesitancy—of waiting for something—

which all too rapidly affects every man on the job, and does more to increase the time-cost of work than any other ordinary cause. When it is obvious to the men that the materials are waiting for them, that the instructions are clear in advance or come with certainty when required, and that the foreman of the job is able to place his men with confidence where required, every man works better and faster. There is no dawdling, because there is no excuse to dawdle, and quite a different spirit animates the men when the work goes forward smoothly. To say that this may easily make a difference of 15 or 20 per cent. in the labour cost of work is no exaggeration, and such a difference not only means success or failure in competition and profitable execution, but it enables the master to put in better work, and to improve his reputation by doing so. Nothing pleases the client or his architect more than to find a readiness to go a little beyond the wording of the contract, and this can often be done. Well, then, let us see what sort of organisation will conduce to good management, and in doing this, I must argue from the position of a firm prepared to undertake fairly large works of an ordinary kind, because, although good management is important in all work, great or small, it is obviously of more importance in large work, and the organisation needs to be more complete. Moreover, while there is plenty of room for variation in the detail with individual firms, according to their constitution and the nature of the works they undertake, a general principle will underlie successful methods of management, and the adjustment of details is not a difficult matter when the principles are kept in mind. The organisation will, in a sense, be twofold—viz., that at headquarters—i.e., the master's business premises, and that at the job itself, which may be "in town"—that is to say, within easy daily control from headquarters; or in the country at such distance as to admit only of more occasional control and direction. Let us take "headquarters" first. We there require (besides the bookkeeping staff, which I do not propose to deal with):—1. The colour-shop and stock. 2. The scaffold yard. 3. An active head foreman, with one or two intelligent painters' labourers under him. 1. The colour-shop is practically the working centre from which all the necessary materials, tools, and appliances are issued. Attached to it should be a small lock-up office for the foreman, and one or more lock-up storerooms for the colours, tools, implements, and materials which are necessary for issue at short notice, or before office hours. Rough entry-books must be kept, in which every article issued can be booked to the job, and all "returns" noted. A colour-grinding slab or two, and hand mullers, though less indispensable than formerly, are at times very useful, and shelves for pails, pans, and cans will help good order. Either in the colour shop, or near at hand, should be the oil tanks, capacious enough for at least two years' consumption, and space for casks and firkins of white lead, which should always be kept in stock, and bought well in advance. If there are three oil-tanks, the contents can be used one at a time in succession, each tank being refilled as soon as empty. The scaffold yard should, if possible, be close at hand, so that the foreman may at once see what is available, and keep it all well under inspection and in good repair. I need not go into minor details. The point is that premises and plant should be fitted for the prompt supply of the ordinary requisites, in condition ready for use. The qualifications desirable in the headquarters' foreman differ a good deal from those of the foreman of the job, and there are reasons why it should not be too much insisted on that he is the head foreman. He is the centre means of communication, but should not be encouraged to override the local foremen in their management of their own jobs. He ascertains what men will be required, and engages them and discharges them. He collects the time-sheets, and checks them; issues the materials; ascertains what scaffolding will be required, and takes care that it is ready when wanted; corresponds with the country foremen, and learns from them when they will be ready for men, or when the number may be lessened; he arranges the transfers from one job to another, and should know exactly which men are best fitted for the work to be done. In fact, he should be the master's eyes and ears in all matters of detail, and be always ready to report verbally on the state of each work. I think it very important that this "central" foreman should not be too old a man. He ought

to be young enough to be very active, for he will require to be constantly on the move in busy times. A bicycle is a very useful accessory for him, for by its aid he can run round to two or three works in the early morning, and be ready to report on them by the time the business office is open; and in any matter of urgency it will often enable him to see for himself instead of sending a messenger. He ought to be a good practical painter; and he should be able to make a correct plan, or to measure up simple work: to use the more expert he makes himself in this direction the more valuable will he be when he ceases to be a foreman. His "labourer" assistants must be intelligent men, who can read and write fairly well, and are capable of entering outgoings. If one of them is a scaffolder, so much the better. We now come to the organisation at the job, and here we must for some reasons divide the subject under two heads—"town jobs" and "country jobs," to use the familiar word. Inasmuch as work "in town" is within easy reach from headquarters, it can, to some extent, be directed thence almost daily. It is, therefore, less necessary that the foreman of the job should be either so experienced or self-reliant as we shall see to be requisites for country work. He can be helped in moments of difficulty by a visit from headquarters. It is more important that he should be punctual, careful, and a good manager of men, than that he should have any artistic or otherspecial technical qualifications, for these will be readily supplied otherwise. But he should be both strict and just, and the man who disregards his instructions twice should not have a third opportunity. In more ordinary and smaller works, where from four to a dozen painters suffice, the foreman should be a skilled hand, who can be depended on to work himself and keep the others working. It is very convenient when such a man can draw a little, put in trials of colouring, and do a little writing or gilding. This applies still more where the small work is in the country, and to send down specialists means undue proportion of cost. With large works at a distance, such as public buildings or very large mansions, the most important qualifications for a foreman are punctuality, sobriety, tact with men, the habit of looking ahead, and good, self-respectful manners. A man prone to quarrel, or to be easily moved to angry replies, should never be put in charge of country work: he is sure to make enemies among the men or the servants, even if he does not fall out with the owner. But a certain self-reliance and forethought are very indispensable qualities in the foreman of a country job—and the man who only knows what is wanted when he actually feels the want, is not the man to take charge of country work. In organising the work itself at a country job there are certain preliminary inquiries to be made, the replies to which may much affect the arrangements. These are, first, What facilities are there for obtaining scaffolding?—for although it is probably better to send down a few "steps," it is, at long distances, essential to hire (sometimes to buy and sell again) the pole scaffolding, and probably better to get the tressels roughly made to the proper heights. The question of lodging facilities should also be gone into in advance; for occasionally this presents a real difficulty, and is very apt, if neglected, to raise disputes. Arrangements should always be made for the foreman to lodge near at hand, if not on the premises. These are matters the neglect of which may cause serious delays, and should never be left to chance. Again, it is desirable to have an understanding as early as possible as to where the workmen may take their meals; and, if there are to be many men, who is to do their cooking. It is better to let the foreman engage a woman for this: otherwise you will find that one labourer's time is practically occupied over the men's meals. Of course, in a town some of these questions do not arise; but country works are often far from a town. The question of obtaining labourers on the spot for unskilled labour should not be forgotten. Another matter which often arises is the question of obtaining the suitable change for paying wages. I have constantly found it necessary to send country wages in the form of gold coin in parcels by registered post; but even then much time is often lost in obtaining the necessary silver and copper change for a number of men. Where the work is in or near a town where there is a bank, it is sometimes as well to open a temporary account with the local bank, giving them notice that a certain approximate amount of

* A paper read before the London members of the Incorporated Institute of British Decorators, by JOHN D. CRACE, Hon. A.R.I.B.A., President, on Monday, December 14, 1903.

silver and copper will be required with the change for your cheque each week. You then send your cheque for the required amount of wages to the foreman, who reckons up beforehand the proportions in which he requires his change. In very large works, take care to have one man who is skilful in matching and mixing colours. This would occupy too much of the foreman's time, for he needs to be moving about and seeing that as each man finishes one job he has another ready for him. If he finds a man habitually shirking, it is cheaper to send him back to town than to keep him. A loafer always tries to get others to loaf too. I have, so far, said nothing about the artistic part of the work; but, assuming that some of it is to be executed by artists on the spot, it is obviously very necessary that as early as possible the preparations for this should be made. Dimensions of all parts to be ornamentally treated should be taken directly such parts can be got at, and where ceilings and cornices are out of reach with steps and ladders, it is often worth while to erect the scaffold, or part of it, before it is otherwise wanted, to enable careful measurements and paper templates to be taken, in order that full-size sketches and drawings may be prepared in good time. These should first be drawn in charcoal, and if possible tried up to judge of form and scale before being definitely drawn in—particularly when the height or proportion of the place is unusual. Even with much experience one may easily be deceived about scale at unusual heights, and it is easy to find cause for regret when this precaution is omitted. When there is much repetition, trials in colour should also be prepared. Where the bringing forward of the grounds is likely to leave scant time for the artist, that portion of his work which requires most time and care may be executed, up to a certain point, on canvas, and affixed, and completed by him on the spot when the general work admits of it. In such a case, however, it is most important that he should be acquainted with the exact circumstances of the lighting, the position of the windows, &c., before he begins; and it will hardly be safe for him to begin his colouring until the general grounds and the relieving tones of colour of the surrounding surfaces have been decided by actual trial on the spot. Even then the decorator must be prepared to make some alterations up to the last moment. When the actual tints and colourings have to be decided, the person who is to direct the colouring (and he ought to be the master decorator himself) should give notice of his visit for the purpose, that the foreman may have all ready—colours, boards, and palette, suitable fitches and sables, and small pans for the samples of colours when decided. Particularly, every local foreman should be provided with a palette-knife (artist's size) with which the master may mix his trials in small quantity. Nothing is more vexing than to find, when about to try colours, that the only available palette-knife is an implement with a blade 1 ft. long, and perhaps 1½ in. wide. It makes a mess of the whole palette with the first tint mixed, and much time is lost. Then the pigments likely to be used should be ready, arranged in order on a trestle board covered with a clean paper if the tints are to be delicate. And here I may say, parenthetically, that the pigments ordinarily required are few, and that all the fancy blues and rose-colours, of which ill-trained foremen are so fond, are absolutely unnecessary in nine cases out of ten. They are, moreover, apt to do harm, being frequently very fugitive. When a complete trial, say of the cornice colouring, has been made, samples of each of the approved tints must be put aside, either in pans, or, if small quantities, on stencil paper, for guidance in the work. There are one or two of the local foreman's duties in which exactitude is most essential. (1) Taking plans and dimensions. These should always give total dimensions as well as details from point to point. Then, if these do not agree, the error is discovered in time. It is a very common occurrence to find them differ by 2 ft. (one repeat of the rule), and I need not point out what a costly blunder this may be. Another source of trouble is in ceiling plans, on which it should always be made clear whether they are taken "looking up" or following the floor plan. For, if the form be at all unsymmetrical, the deviations are reversed. (2) Making out the weekly time-sheet. Each week's sheet should not only show how many hours each man has worked, but on what portions of the work the men have been engaged. And if any man's time is less than it should be, or more than there was reason to expect,

an explanation should appear on the sheet. If one man's time seems to be short during two weeks or more, special explanations should be written for. The master is paying lodgings and allowances to the same extent per week whether a man works 60 hours or only 40. Among the many possibilities of delay there is the joiner's work; taking off fastenings and furniture, easing windows, small repairs. Let these matters have attention in good time. A more annoying cause of delay often occurs through the work of "other trades," and this is frequently beyond the decorator's control. The operations of the plumber, bellhanger, gasfitter, electric lighter, and, worst of all, the hot-water man, are, not without cause, a terror to the decorator. Each thinks he ought to take all the time till the last day fixed for the general completion; while there is much that the decorator can hardly begin till most of these others are gone. In this matter I can only recommend you to use the Institute of Decorators' forms of contract as a precaution. When work involves much or high scaffolding, bear in mind the importance of getting that portion which is only accessible from the scaffold properly measured and taken to account before the scaffold is removed. This is a matter which the foreman should give ample notice of, and he should have been able to get a good deal of measuring done during progress, where it is out of reach otherwise. This will save the surveyor's time. He should also have clear notes ready as to number of coats, &c., in different rooms, and the amount of extra daywork. In fact all the way through the work, the foreman must bear in mind the final bringing to book, must make a point of being able to explain. He should also insist on cleanliness—his labourers must be frequently sweeping up the dust and any accumulations. I have omitted to speak of one or two details in this connection, as, for instance, the sweeping of chimneys before any painting is done, the covering up of furniture, and floors, and panellings. A good hardwood or parquet floor should be covered first with brown paper, then with sawdust, then with thin boards. But never lay brown paper close down on a white marble floor: it will stain it indelibly. Clean wrappers covered with boards are safer for this. Again, it should be absolutely forbidden the men to throw the water which has been used for washing off distemper down the sinks or closets. It must be taken to the gullies, and even these should be frequently flushed with clear water when so used. With a good foreman London workmen will be on good terms with the servants and neighbours. In country places workmen of good character and conduct can be a very pleasant addition to village society, and are readily invited to join in whatever amusements go on after working hours; and I have known many a client say that household and village have all regretted the men's departure. In winding up work, leave all clean, room by room, as you finish. It is always worth while to hire a charwoman from the village to scrub the floors during the last fortnight, and it pleases the house servants to find that they are not expected to clean up after the men. The goodwill of the servants is always worth having, but never worth buying. Where particular servants have been obliging and helpful to the men some recognition is very proper; and where a servant has suffered distinct inconvenience by the work, I think a moderate tip may well be bestowed. In doing this, the master should say that it is in consequence of the foreman having spoken of the inconvenience or the obliging help in question. Let no master decorator lower his own position by "cultivating" the servants, nor notice in any way the hints of "influence" which some upper servants are ready with. Make your own influence with your client, and you will best do this by close attention to all that makes the work go smoothly and in accordance with his reasonable requirements.

WATER PURIFICATION.

At the ordinary meeting on Tuesday, Dec. 15, of the Institution of Civil Engineers, two papers were read, namely:—"Deposits in Pipes and Other Channels Conveying Potable Water," by Professor J. Campbell Brown, D.Sc., and "The Purification of Water Highly Charged with Vegetable Matter, with Special Reference to the Effect of Aëration," by Osbert Chadwick, C.M.G., M.Inst.C.E., and Bertram Blount, Assoc.Inst.C.E. The first paper dealt with three classes of

deposits:—(1) Incrustations on iron pipes; their source, causes, and remedy. (2) Growths, more or less slimy, on inner surfaces of pipes and culverts and tunnels; their varieties, nature, composition, and causes; also the composition of waters which produce different kinds of growths. (3) Loose deposits. Analyses were given of incrustations on iron pipes, and analyses of different kinds of waters were quoted, showing that these incrustations were due to oxidation of the iron of the pipes, whether widespread or in nodules, and that they were not limited to acid waters, but were common to acid, alkaline, and neutral waters. The remedy was briefly discussed, in the light of recent experiments as well as earlier observations. Growths or deposits on the inner surface of pipes were of two kinds:—(a) Deposits of carbonates of alkaline earths from calcareous waters; (b) black slimy deposits, from the top, bottom, and sides of pipes and other channels conveying certain waters, chiefly from Welsh sources. Investigations were recorded, and detailed evidence was adduced, showing that these slimy deposits were produced by gelatinous and filamentous iron-organisms which grew and extracted iron from the water, and died at one end while they grew at the other. Solid rock particles were entangled in this slime, and binoxide of manganese was deposited by chemical action, and this also was entangled in the mass of the gelatinous iron-organisms. Analyses were given of waters which did, and a variety of waters which did not, support the growth of this slime, and deductions were drawn as to the constituents of the waters on which these growths depended. Experiments were described, undertaken with the view of ascertaining the conditions favourable to the growth and the conditions which would prevent the multiplication of these organisms and the growth of the slime. Microphotographs were given of these growths at different stages, and the results of the experiments were described and discussed, in order to arrive at a correct theory, and so at a practical result.

TROPICAL WATER.

The second paper treated of the nature of tropical waters collected in regions free from ordinary sources of contamination, but containing large quantities of dissolved vegetable matter. These waters, wherever their place of origin, presented a great similarity of composition, samples from Mauritius, the West Coast of Africa, Uganda, and the West Indies having the same characteristics. In all cases contamination was caused by the water remaining stagnant or flowing slowly through regions rich in vegetation, which by its decay produced a large quantity of vegetable debris absorbable by the water. Pure Tropical waters might be obtained even from a district densely covered with vegetation, provided that the flow was sufficiently rapid. The purification of waters of this class was very difficult. The authors had found by experiment that treatment with iron was generally efficacious; but the treatment must be more thorough than was necessary with ordinary water-supplies. The peculiar character of these waters charged with vegetable matters rendered the removal of the iron difficult; casual aëration by fountains or cascades was insufficient. Systematic aëration, so as to insure an abundant supply of oxygen, was requisite. Various methods had been tried, and finally an apparatus had been devised in which the water was caused to flow through perforated plates, emerging in streams of small diameter and exposing so large a surface per unit volume of liquid that rapid absorption of oxygen from the air was made certain. It was found that, if the water was delivered at or above a certain critical head, the streams of liquid remained distinct, and if they were caused to coalesce by some temporary disturbing influence, such as a gust of wind, they resumed their position and individuality as soon as the disturbing influence had subsided. The use of this critical head was essential for the proper working of the apparatus, and for the satisfactory aëration of the water. Plant designed on this principle had been erected to purify the water supply at Mauritius and in Uganda; the method had sufficed to change water so loaded with vegetable matter as to be almost unpotable, into a drinking-water of excellent quality. An account was given of the waterworks at Mare aux Vacoas in Mauritius, and of the various improvements in the mode of purification which had been effected from time to time. The principle of aëration had also been usefully applied at Singapore by means of intermittent filtration; but the

authors held that the systematic process described above was preferable on account of its certainty and compactness. They considered that by this means it was practicable to purify diffident tropical waters so as to obtain a satisfactory supply without excessive cost or difficulty of working.

IRISH BUILDING STONES.—IV.

CORK—(concluded).

THE Little Island quarry mentioned in the last article as that which furnished red marble for Liverpool Exchange and Oxford Natural History Museum is now worked exclusively for light grey limestone, the red vein having been exhausted. The main body of St. Finn Barrs Cathedral was built with Ballintemple stone, but Little Island limestone was used in the towers and spires. The new Post-office, the Provincial Bank, Trinity Church (Cork), and many Government buildings on Haulbowline and Spike Islands are built with Little Island stone, which is easily worked and looks bright, contrasting in this respect with the blue shades of Carboniferous Limestone, which, being of a slaty-grey, are rather dismal looking, especially in a moist climate and under leaden skies. Nearly all these limestones retain their colour after long exposures. Toolmarks are as fresh on them as when they were worked centuries ago, and it may safely be said of the Irish Limestones that granite itself is a perishable stone compared with them, and this is true of cut stone dressings obtained from rocks the chemical analysis of which differ in no way from common soft white chalk. Carbonate of lime forms about 98½ per cent. of Carboniferous Limestone, and this is about the composition of Margate chalk. Why, then, is one stone so friable, and the other so hard as to weather this climate for centuries? It will be noticed that all hard limestones can be polished as "marble," and that they are highly crystalline in structure; this structural change appears to confer weathering properties on material which is otherwise valueless for the purpose. Now, as all crystalline stratified rocks were at one time chemical or mechanical sediments, it is obvious that they must have been altered by some process of metamorphism. In this case it was one of molecular change only, though in the white marbles, as, for instance, statuary, chemical change also took place, and all non-calcareous matter was eliminated from the rock. Whether beyond heat and moisture there were other necessary conditions for metamorphism is not at present known for certain in such a simple case as the change above referred to (earthy to crystalline limestone); but it is invariably found that the permeability to water and the alterability of sedimentary strata are greatly reduced by such alteration. It will be recollected that in describing the Antrim rocks chalk was found converted into crystalline limestone by the intrusion of molten basalt; where ordinary or normal Irish Carboniferous Limestone is found converted into Magnesian Limestone the change is due to chemical action, combined with other metamorphic agencies; but this process must not be extended to the great dolomitic deposits of the Permian strata in England, for it is proved that they were thrown down from concentrated solution in an inland salt lake, the waters of which were removed gradually by evaporation. The Silurian and Devonian rocks of Cork furnish good sandstones, which are known to the workmen as "brown" or "Red" stone, the Lower Carboniferous sandstones being "yellow" stone. Formerly sandstone was much used in building, especially for dressed work. The Round Tower at Cloyne is built with it, but in newer buildings in the same locality the dressed work is always of limestone brought from some distant quarry. The Round Tower at Cloyne is in a good state of preservation, and as it is a prehistoric building, the value of the light-brown as a building stone, of which it is built, may be guessed by its present condition. It is quite true Petrie tried to prove that the Round Towers were of comparatively recent date, probably about the 9th or 10th century, and consequently of Christian origin; but as his views were based on certain details in or about the doors and windows of these structures, which might have been, and probably were, later insertions, his arguments go for nothing. Take the Kildare tower, for instance. There is a fairly good "Norman" doorway, giving admission to it at a height of about 20ft. from the ground, and this

being clearly a late insertion, the age of the doorway can give no clue whatever to the age of the tower. Crosses have also been inserted in the walling over the doors and in the roofs of some of the towers; but no one has ever yet explained of what use these towers could have been in the performance of any act of Christian worship. In the case of the Kildare tower referred to above, it stands over 50ft. away from the church at the north-west end, and it has no connection whatever with it. When a circular tower is found at the west end of any church in East Anglia, archaeologists assert the shape is due to a want of stone to work square quoins, but the Irish towers are not round from this cause, for massive stone of suitable quality is common enough all over the country. As this is not the place to discuss the various opinions expressed as to the origin and uses of these strange buildings, the writer will close this reference to them by saying that it is extremely probable they are relics of Phallic worship, and are consequently amongst the oldest buildings in these islands, Stonehenge not excepted. Good building sandstones are found at Sherkin Island; Drumeona, six miles from Skibbereen; Glendore; in the mountains near Mallow; on the Duke of Devonshire's property near Bandon; and in several places near Cork on the north side of the Lee; but there are no quarries of any general interest in the sandstone rocks of this county at present. Many of these sandstones have cracks or fissures in them, which make the stone valueless for some purposes, and this even though the blocks look dense and compact to the eye. All the sedimentary rocks in this county yield slates. In 1835 the following quarries were in work, producing slate of "good" and excellent quality:—Probst and Glentane, Ringabella, Ennisearra, Kilbrittan, Bracknagh, Enniskeen, Mohanagh, Rooska, Audley Cove, Sherkin Island, Clonakilly Bay, Forkhill, Donaghmore (the two latter being near Clonakilly), Robert's Cove, Trabolgan, Carrigduff, and Derry Gool. Five hundred hands were employed in the Audley Cove slate quarries, the produce of which had a ready sale in London. The Sherkin Island quarry was worked by 100 men, and many cargoes of slate were also sent to London (in 1835). Robert Hunt, in scheduling the Cork quarries in 1860, does not mention one as being worked for slate; the output then was marble, limestone, and sandstone. Last year there were four slate quarries in work—viz., Benduff, Braalish, Drimoleague, and Madranna; but the managers of these have not sufficient energy, or business capacity, to answer an inquiry as to the quality, size, or price of their slates. The slates in these quarries are dark grey, some nearly black. Pyrites, nodules, and a curly structure are sometimes found, and they, of course, take much from the value of the slate as a roofing material. The Benduff vein, which is 70 yards wide, turns out very dark grey slates. Slate rocks have always been used in this country for building; they are worked into sills, steps, and rough quoins when dressed, and rubble walling when simply broken across with a hammer. The Round Tower of Kinneigh is built with slate rock, and so is Timoleague Abbey, an early Irish building, which illustrates the good quality of the slate, and the simple and proper mode of using it; "the design and constructive arrangements being suited to the materials employed." Near Bandon slate rock makes a good building stone, for it can be joint-bedded, and worked freely across the end grain. Since writing on the composition of Irish Carboniferous Limestone an analysis has come to hand which enables one to make an exact comparison of the chemical constituents of that rock with those of chalk, the latter being a specimen of the "upper white" from Shoreham in Sussex.

	Cork Limestone.	Sussex Chalk.
Carbonate of lime	98.35	98.40
Carbonate of magnesia	0.60	0.68
Alumina	—	0.42
Iron oxide	0.60	—
Silica	0.23	1.10
Water	0.25	—

It will be seen that the amount of carbonate of lime in both rocks is practically the same, and that they differ only to the extent of 1.6 per cent. in accessory substances. Yet the limestone will carry 400 tons to the foot, while one ton could not with safety be placed on white chalk without risk of failure. The analysis of limestone given here was furnished by Mr. Cantillon, being that of an average sample from his Little Island Quarry. He has also quoted the following

prices for labour only on this stone. Quoins with chisel draft on arris, and punched face 5s. per foot superficial, tooled work 6s. Chisel drafted and punched is quoted at 6s. per cubic foot, and tooled work at 7s.; but what the latter prices refer to is not easy to understand, for work is not usually done by the cubic foot, though any practical mason can tell, on looking at a drawing, what the value of a cubic foot of masonry is, "labour and material" both included, without pricing out all the labours as suggested by the modern London surveyor. The hard limestones of Ireland cannot be worked like the soft oolites of England: a tooth saw or drag would merely scratch them, so that dressed work must be wasted down from the rough block, which is first roughly hammer dressed ("scabbled") to the sizes required. There are 13c. ft. of limestone to the ton, and it can be obtained in rough blocks f.o.b. for 6s. per ton, or about 5½d. per cubic foot. It would be worth while to give the stone a trial in London, as, in addition to its being a good weather stone, it is non-porous, and would not hold the "blacks" washed out of its smoke-laden atmosphere. Quarry proprietors frequently furnish architects with analyses of their building stones; but it will be seen that such information is no guide whatever to their weight-carrying or weathering properties under ordinary conditions. If a stone is sought from which lime or cement is to be obtained, then its chemical analysis becomes a matter of the first importance. The same may be said of a stone required to line a kiln, or as a flux for iron ore. Under other circumstances a knowledge of the chemical constituents of a stone may be misleading, although it is always interesting.

DONEGAL.

The rocks here are Middle Carboniferous Limestone with shale and sandstones; Lower Limestone with dolomite; Lower Limestone shale and calciferous sandstone (289, 292, 305, 324); Old Red Sandstone; Crystalline Limestone (266, 329), steatite, micaceous and chloritic schists and sandstone (311); Quartz Rock (273), Altered rocks of Silurian age; Granite Basalt and other igneous rocks. Ballyshannon is built on Lower Carboniferous Limestone with dolomite and quartzite. Donegal: Calp. Basalt. Letterkenny: Metamorphic schists, Alluvium. Lifford: Alluvium and Schistose Metamorphic rocks. Between Donegal and McSwyne's Bay there is a tract of Lower Carboniferous sandstone extending inland to the north of Lough Eask. This is bordered by a narrow margin of Old Red Sandstone; all the rest of the county is occupied by altered Crystalline Limestone and Sandstone of Silurian age, and igneous rocks. There are two types of Lower Silurian rocks in Ireland, as there are in Scotland, one consisting of schists, sandstones, slates, and beds of limestone as they were deposited, and the other of crystalline limestones, quartzite, and schistose rocks altered by metamorphism, which in this case was due to the action of intense heat, steam, and pressure. In Donegal, and other northern counties, shales and slates have been converted into schists, sandstones into quartzite, and shales and grits into granite; in the southern counties the rocks are unaltered. Crystalline rocks therefore form all the Highlands of this county, and they are of the same geological age as the ordinary rocks of the Chair of Kildare and other places, both being represented in Wales by the "Bala Limestone." In the centre of Ireland the Lower Silurian rocks pass under the great sheet of Carboniferous Limestone found there; where they emerge on the south, the strata are of the ordinary fossiliferous type; but in the north, where they rise into hills and mountains, they are seen as crystalline schists, quartzite, and granite formed by the fusion of the same rocks. Kinahan says that the metamorphosed rocks of Donegal are supposed to be of Cambro-Silurian age, and it may turn out that some of them are Cambrians, or even Laurentians. The whole series are interesting and peculiar, as some of them are metamorphosed eruptive rocks, so that in the same areas there are altered eruptive and altered sedimentary rocks: these include Opelite, Ophiolite, Steatite, Eklogite, Onkosin, Pyralolite, Magnesite, Epidosite, Sepiolite, Meerschaum, and others. The Donegal hills therefore afford a rare collection of ornamental building stones, many of which are at present wholly unknown to the trade.

The newest rocks here are the Carboniferous, and they furnish the builder with limestones and

sandstones. The limestones are found covering small areas near Donegal and Ballyshannon; but they are not much used, except for lime-burning. The Donegal stone is an earthy, greyish, black calc; and that quarried at Ballyshannon, which works freely, is greyish-blue, compact, rather earthy, and semi-crystalline. Ballyhanna stone, quarried near Ballyshannon, is a grey magnesian limestone on the north side of the river Erne, and a dark limestone on the south side. It has been used in all the buildings of the neighbourhood. The R.C. chapel and infantry barracks at Ballyshannon were built with limestone quarried close to the town. A quarry in the same rock at Laghey, which furnished stone for the Methodist chapel in Donegal, is now closed. The limestone was hard and flinty, though it was easily quarried, on account of its being well bedded: it worked badly—the colour is a dark grey, nearly black. The most important building stones in the county are the Carboniferous Sandstones, and amongst these the Mount Charles stone is the most celebrated; the name of the quarry is “Drumkeelan.” This is a greyish brown felspathic sandstone, slightly micaceous with siliceous ferrous cement. The late Mr. Cockburn, an extensive Dublin contractor, said of the Mount Charles stone: “It is a good durable stone, hard to work.” Unfortunately this opinion is not borne out by the present condition of the Dublin National Library and Museum, where this stone was used only a few years ago, for many of the balusters in the parapets are in an advanced state of decay, and in every place where water hangs, as under projecting sills, &c., the stone shows unmistakable signs of failure. The ashlar walling here is of granite and the dressings of sandstone apparently because there was some saving of cost in this arrangement of the materials. The state of the marble panels on the drum of the reading-room shows the utter absurdity of using coloured marbles polished for decorative purposes out of doors in this climate. The Drumkeelan Quarry, which is three miles from Mount Charles Pier, also furnishes paving, which is much used in the town of Donegal. The other Carboniferous Sandstone quarries are Lettercran, three miles from Pettigoe, used in the stations on the Enniskillen and Bundoran railway; Altito, three miles from Donegal, a dirty yellow, hard, quartzose, and semi-crystalline stone, with a felspathic cement, used for walling in Lough Eske Castle; Beauwin, uneven in grain, with large quartz pebbles. Some of the beds are of fine texture and good colour: surface stones are chiefly worked here. Kildoney, four miles from Ballyshannon, white, micaceous, and siliceous, works fairly well, used for walling; Dogs Mountain, a free-working, cream-coloured, fine-grained ferruginous stone, sufficiently well bedded to be used for flagging; it was used in Ballyshannon Parish Church. In a ridge of Calp sandstone near Bundoran good free-working stones are obtained, which may be seen in many buildings in that town. The next rocks in descending order are the Lower Silurians, and they furnish the builder with limestones and sandstones more or less metamorphosed. The limestones are sometimes of a kind well suited for dressings, and they may be polished for marble; but unfortunately the grain of the rock is coarsely crystalline, or fine when it is thin bedded, and so full of joints that it can be raised in small pieces only. These metamorphic crystalline limestones may be found in the following quarries. Ballymore: Cream-coloured, crystalline, takes a good polish; though difficult to work, it makes good dressings. Glaisheen, pink and white, clouded with grey; slightly schistose, but may be polished. Rockhill: The pyrites in this stone discolours it on exposure; it is a grey colour, and micaceous. Rineevin: Greyish, highly crystalline; a good stone. Dunlewy: Creamy-white, pink, with blue and green tints; the tinted stones, being in thin beds and much jointed, are of little value. A hard white crystalline stone was raised here for the church which stands near the quarry. It is a good weather stone, and keeps its colour. Other quarries in these altered limestones are Lettery, Fintown, Glenveagh, Lough Akibbon, Drumlagh, Ardunawark, Magheraboy, Cloghroe, Cullancon, Kiltale, Magherasolus, Crauford, Kindrumlough, Tamney, Kintale, and Hillhead. These quarries furnish white, pink, cream, and bluish-grey crystalline limestones suitable for dressings or decorative work when polished. Detailed information about them may be seen in papers of the Royal Geological Society of Ireland by Professor Kinahan,

who is the best authority on the subject, as he has not only considered it theoretically, but also practically, so that any person looking for building stone should be guided by his advice in searching for a suitable quarry site. The Lower Silurian arenaceous rocks are chiefly quartzite; but some unaltered sandstones are found in the Raphoe and Rathmullen districts, and these, too, have been used for building. Some of the quartzite quarries are Muckish, Rineevin, Errarooney, Minnagran, Carrick, and Killyclug. The stones vary in colour from pure white to brownish and yellowish grey, many being suitable for walling and dressed work. There have been many attempts made at slate quarrying in this county, the most successful being at Glentown, two miles west of St. Johnstown, where slates were worked, on and off, for over 100 years; being used locally or shipped to Glasgow. The vein here is crossed by so many joints that large slates cannot be obtained, the largest being about 2ft. long and from 4 to 12in. in width: the colour is dark grey, and the “ring” of the metal good. This quarry was closed in 1879. Slates are also found in the following places:—Dunwiley, Thorn, Milford, Strawbridge, Carrick Macrolly, Dunmore, Buncrana, and Fahan Point. There were no slate quarries worked in this county in 1850, nor are there any worked at present. The igneous rocks, which are found thrust up through the stratified silurians (the latter being bent and folded as if subjected to some great lateral pressure), consist almost wholly of granite and gneiss. It is evident that in this locality the older stratified rocks were thrust up and contorted by the invasion of granite. That they sometimes lie unconformably on each other is the result of denudation; in fact, each successive layer of the silurians here was thrust up and altered in turn, volcanic action being almost continuous during this geological period. The granite is therefore not all of the same age, as it is certainly not of the same origin, the older intrusive granite being found to the west near the sea by Dunglow, and in the Barnesmore Hills north east of Donegal town, whilst the younger granite occurs entangled with schists in Kilmacrennan and Inishowen. It was thought at one time that granite was a kind of primary rock; the solid part of a liquid magma, which filled the centre of the earth; but it is now known that nearly all granites were at one time stratified rocks, and that they have been altered by intense heat and pressure. Slate rocks and grits, if melted and cooled down slowly under certain conditions, will form granite, and no primary granite is now known. In the western part of the country there are dykes of metaphyre or dolerite of the same age as the basalt of Antrim, which is post-cretaceous. These rocks are in some places found to be suitable for cut stonework. The granites are found in all colours, dark (almost purple) red, rich bright red, salmon, pink, rose, silvery grey, deep grey, blue, and green! That such an immense store of valuable decoration and constructive material should remain so utterly unknown and neglected seems almost incredible, a state of things that can only be accounted for by the extraordinary political, social, and economical conditions prevailing in Ireland at the present day, and which apparently tend to the extinction of all native industry. In 1859 there was only one granite quarry worked in Donegal, that at Dungloe. This quarry was scheduled last year as being still in work by the Donegal Granite Quarries Co., but it is now stopped. Another granite quarry, that at Carnagore was also scheduled as being worked by Mr. O. Battie, of Bradford, Yorks, with 29 men; but this is also closed, and at present no granite is raised in Donegal, whilst thousands of tons come here yearly from Sweden and Norway. Some of the most noted granites are Barnesmore, a red which was worked into dressings and monumental work at Bessbrook in Armagh. There is also a grey granite in this district. Minnagran is a gneiss rock, grey, coarse, and difficult to work. Dungloe, an even-grained granite which is easily quarried, as it has regular beds and joints, but still yielding blocks of large size. The colours are a rich red, changing through pink and rose to silvery grey. In the Rosses there are light and dark red granites at Burton Port, Leckene, Lefinn, and Garron Hill. Some of the Duogloe granites are grey, that at Lough-na-Geeragh is white. Croach-na-shollog, near Dunglow, is very red, and may be obtained in large blocks. Glenveagh, foliated, hard, durable, used in Glenveagh Castle; Barnesbeg, grey and red,

even-grained, works well; Magherararty, Bloody Foreland, grey, easily marked with sills, quarries, and other dressings; Torries, Arran Island, coarse, pink, with hornblende; Finford, grey and pink, suitable for dressings and polished work; and Lackagh Bridge, gneiss of a pink shade, which works well into dressings and ornamental slab. The Earl of Leitrim sent several granites to an exhibition held at Olympia in 1888; all these were quarried around Mulroy Bay, the colours being pink and grey. Many of the Donegal granites are obliquely foliated, like the accompanying quartzites and sandstone, and this has led to the belief that the granites were originally sandstones which passed through the intermediate stage of quartzites. Some of the granites described here are more or less “gneissose.” Gneiss, when typical, is a granular aggregate of quartz, felspar, and mica, occurring in plates or layers parallel to each other. Accessory minerals are frequently found which interfere more or less with the regularity of the layers.

PRESERVATION OF TIMBER.

SEVERAL processes have been introduced to render wood less liable to natural decay. The method of saturation is one of them. The mechanical saturation of wood is a comparatively new process, and was first tried thirty or more years ago, by means of an apparatus designed to saturate timber with preservative solution. Several preservative processes are in use, and in Germany and the United States they are numerous. The principal aim is to get rid of the sap-water so favourable to the propagation of germs; attempts have been made to liquefy the real sap and suck it out by vacual extraction. The principal steps in the process of saturating timber are as follows:—(1) To introduce steam to liquefy the sap; (2) afterwards to remove the substances liquefied by vacuum pumps—an operation requiring a long time, many hours; (3) to fill the cylinder with a preservative solution, allowing it to impregnate the wood as far as possible; (4) applying hydraulic pressure to assist the saturation. Such is the type of apparatus and process used for the purpose. The long time necessary to saturate the timber, often thirty hours or more, and the difficulty of reaching the heart of the timber; the serious injury done by steaming and exhaustion of the sap, and other objections to the chemicals introduced, besides the cost, are reasons that have been urged against the process. A newer process has been used, and is described thus: “The cylinder, instead of being 84in. diameter, is 50in. diameter and 112ft. in length; the cylinder body is made of cast-steel flanged sections, 2½in. thickness, with a special hydraulic joint at the flanges capable of enduring a hydraulic pressure of 1,000lb. per sq.in.; at each end is a domed gate with a vertical hydraulic cylinder superimposed, which operates a vertical gate-valve weighing 5 tons. The gate has phosphor-bronze rings. When the internal operating pressure comes upon the gate, these ring surfaces coincide, and the joint is perfect, whether with 10lb. or 1,000lb. pressure; the greater the pressure the tighter the joint.” The hydraulic accumulator is loaded to the normal saturating pressure for each kind of wood. For white pine the saturating pressure is 300lb., yellow pine 350lb., ash 400lb., chestnut 400lb., beech, birch, and maple 450lb., oak 650lb., and the direct saturation by this machine is 1in. thickness, and can be performed under these pressures because of the absorption of shock from pressure pump, with perfect results to the wood, and in much less time than required by the old system. The wood is simply put into the cylinder, the gate is closed, the cylinder is run full of saturating liquor, pressure is applied, liquor is returned to the tank, the timber is run into a dry kiln, and another charge of timber is run into the cylinder. Chloride of zinc is said to be a good preservative for railway ties, and may be used as the first solution, or sulphate of zinc, which is cheaper. Practical experience has proved that for wood exposed to weather conditions no treatment would be permanent except one, that would create a chemical double decomposition in the interior of the wood. The secret of the improved process is to admit the liquor under pressure, so that it will pass longitudinally through the timber and find its exit through an opening in the gate; the water on the wood will be driven out before the liquor, and the liquor in full strength will follow. The small valve in the gate is then closed and the

pressure is kept up on liquor entering the end of tie; the natural traverse of the liquor is radial to its longitudinal axis, and it goes out through the medullary rays to the surface of the tie evenly. Then a second chemical solution is applied, the whole surface of tie is enveloped in it, a pressure is put on the liquor which will saturate the tie compressionally and thoroughly, and the last chemical mingling with the first produces a double chemical decomposition, filling the cells of the wood with an insoluble substance, which renders impossible the exit of the chemical from the wood under any weather conditions. This second chemical may be chloride of calcium, which pens in the chloride of zinc by the nearly insoluble sulphate of calcium. Such is, in brief, the substance of a paper by Joseph H. Ferrell, discussed at a meeting of the Engineers' Club, Philadelphia.

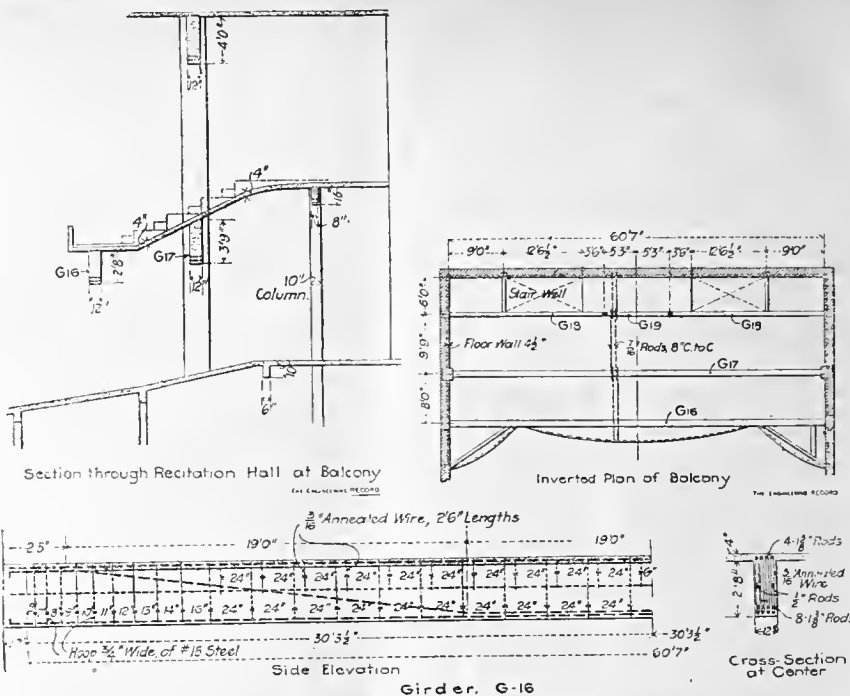
TOWN AND COUNTRY HOUSE DRAINAGE.*

EVERYONE connected with house building knows well enough that sanitary requirements cannot be ignored with impunity. It is, however, equally certain that a very large number of even important houses are little better than death-traps in this respect, particularly in places beyond the immediate control of town authorities, though even in the heart of cities and crowded areas unless an immediate nuisance is in evidence little can be done to mend matters. An instance in point may be mentioned. A large London house in the West-end was being improved and done up, and amongst other things the architect had to examine and report upon the drainage. The house had always been in the hands of people with ample means, and never, in all likelihood, would any but West-end builders have been employed upon the premises, which to all appearance had been continually well cared for. It was found, however, that no trap had ever existed between the sewer and the house drains. What was calculated to make matters worse was the fact that the street sewer had some years before been lowered, and the branch drain in question had been then connected with it by a vertical pipe entering the sewer into its topmost crown; consequently the sewer gas was afforded every facility for escape into the house referred to. The strangest part of all is that the aforesaid drain passed through the premises, up the outside at the rear, and terminated in a w.c. situate in the midst of the bedrooms at the top of the house. The sewer gas in this instance was thus laid on to the building in the most perfect fashion; still no one had died or were even ill in consequence, so far as could be ascertained. The only palliative was a big sweeping staircase right up through the building, which acted as a shaft or lung, so to speak, for upcast ventilation. Drain ventilation there was none, and in the floor of the basement a bell gully trap occupied a central position, with all the risks which need not be enlarged upon here.

Mr. G. A. T. Middleton has just brought out a little volume published by Mr. B. T. Batsford, of Holborn, which supplies a well-arranged series of chapters dealing with the subject of house drainage in town and country, accompanied by illustrations of a variety of traps, closets, pipes, junctions, manholes, baths, sinks, and all the rest of it, making matters clear, and adding suggestive ideas as to flushing, testing, and reporting upon drains, as well as by-laws referring to sanitary requirements. Septic tanks and disposal methods are described, and a variety of information collected from various makers of sanitary appliances is added. These is also an outline specification for drainage works. Anyone dealing with undertakings of this kind can only do so, of course, successfully after experience. The learner, however, will find Mr. Middleton's book efficient, and to serve its purpose, and for the student's use we confidently recommend it.

AN ARMoured CONCRETE BUILDING FOR THE COLLEGE OF MUSIC, CINCINNATI.

THE College of Music, Elm-street, Cincinnati, had two halls for public concerts and similar purposes, which were destroyed by fire in August, 1902. When it was decided to rebuild at least



Some of the Concrete Steel Details of the College of Music, Cincinnati.

one of these, the consulting architect strongly advised the use of a fireproof construction, although there was not enough money in the treasury to pay for the additional expense. It was found, however, that armoured concrete could be used to make the hall fireproof at a cost not greater than that of steel girders and wooden floors.

The new recital hall is 60ft. 7in. wide by 80ft. long, and has in front a stage and in the rear a balcony, both extending across the entire building without an intermediate support. The roof is of armoured concrete construction, consisting of a 4in. concrete slab braced by ribs 15ft. apart, supported by four concrete girders 12in. wide by 48in. deep, spaced 16ft. apart. The gallery is carried by one concrete girder 12in. wide by 32in. deep and another of the same width but 43in. deep, both having a clear span of 60ft. 7in. At the staircase, the balcony is supported by 8in. by 16in. girders. Accompanying illustrations show a plan of the balcony, a section of the hall at the balcony, and the reinforcement of girder G16. The depth of this girder is but 2ft. 8in., so as not to encroach on the already very small clear height from the floor to the bottom of the girders.

The girder contains in its lower half eight 1 1/2in. steel rods, four of which are straight and four bent at the third points of the span, the latter reaching the top of the girder near the supports. Around each pair of rods are ranged a number of hoops, 3/4in. wide, of No. 16 steel, bent into the shape of a U, spaced from 5in. to 24in. apart. These hoops take up the horizontal shear in the girders, and are therefore spaced closely together near the supports.

As the balcony floor at girder G16 was not of a large enough section to take up the compression in its upper part, four 1 1/2in. rods were there embedded to take up that part of the compression which was not provided for by the concrete forming the floors. These compression rods are kept from buckling upwards by pairs of 3/4in. annealed wire rods, 2ft. 6in. long, spaced 24in. apart. These wires were embedded in the concrete before the top rods were laid in place, and afterwards the 1 1/2in. rods were surrounded by concrete. The wires of each pair were twisted together and prevent lifting of the rods through their adhesion to the main body of the concrete. For the lower part of the beam the concrete used was in the proportion of one part cement, two parts sand, and three parts crushed gravel, 3/4in. size and under. For the upper part of the beam, 1 : 2 : 4 concrete was used.

Girder G17 is situated much higher above the floor of the hall, and could have been made 3ft. 9in. deep; but as the floor area to be supported was much greater, the same size and number of bottom rods were used as in girder G16. The greater width of the floor allowed a reduction in the number of compression rods to

three. The floor between girders G16 and G17, as shown in the section of the balcony, makes a considerable bend at about the centre of the span. It was made 6in. thick and reinforced by 1/2in. rods, 8in. centre to centre, placed about 1/2in. from the bottom of the floor. The concrete used for this was in the proportion of 1 : 2 : 5.

The girders supporting the roof are reinforced by the same number of top and bottom rods and steel hoops, as in girder G16. The roof proper is divided by 8in. by 12in. beams into nearly square panels, 4in. thick and reinforced by 3/4in. rods, 9 1/2in. centre to centre, in both directions. The roof girders are nearly 30ft. above the floor of the hall. The supports for the moulds consisted of pairs of 2in. by 6in. uprights placed 5ft. centre to centre, and heavily braced together. The bottoms of the moulds were 2in. planks suspended from 2in. by 6in. cross pieces nailed to the verticals, and the sides were 3/4in. matched boards fastened to the 2in. by 6in. uprights and stiffened sideways by intermediate frames. To support the centring for the roof slabs 2in. by 10in. planks were run between the girders about 2ft. 6in. apart. The centring for the beams was struck four weeks after the concrete was placed. The roof girders deflected under their own weight and that of the roof slabs but 1/4in. Girder G16 deflected 3/4in. and G17 but 1/4in.

Girders G16 and G17 were figured for a floor load of 90lb. per square foot. They were tested on August 25, 1903, by a load of 50,000lb. The load was distributed over both girders in approximately the proportion of the live load to be carried by them. The greatest deflection produced was 3/4in., which is nearly 0.0025 of the length of the span, certainly a remarkable performance. The deflection did not increase for the two days the load was applied.

Atlas Portland cement was used throughout the building, which was finished, together with a four-story school building, within three months after the signing of the contract. Mr. G. W. Drach, Union Trust Building, Cincinnati, was the architect. Mr. L. J. Mensch, civil engineer and contractor, Monon Building, Chicago, designed and contracted for the concrete work under the Hennebique patents, for which Mr. L. Eid, Cincinnati, was the subcontractor. This example shows the adaptability of concrete-steel to the rapid construction of moderate cost fire-resisting buildings.—*The Engineering Record.*

At St. Paul's Church, Thornton Heath, General Crabbe has unveiled a stained-glass window as a memorial to the men of the parish who served in the South African War.

The Primitive Methodist chapel and Sunday-schools in Parchment-street, Winchester, a large block of buildings on the site of an old independent chapel and a demolished house, were opened on Thursday in last week.

* The Drainage of Town and Country Houses: A Practical Account of Modern Sanitary Arrangements and Fittings. By G. A. T. MIDDLETON, A.R.I.B.A. With ninety-three diagrams (4s. 6d. net). London: B. T. Batsford, 1903.

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ILLUSTRATIONS.

NATIONAL PRIZE DRAWINGS FOR COLOURED PRINTS FOR CHILDREN'S BOOKS.—THE PASSMORE EDWARDS POLYTECHNIC, CAMBERWELL.—HOUSE AT GARSTANG.—SELECTED DESIGN FOR ACTON COUNTY SCHOOL.—METHODIST FREE CHAPEL, NUNEATON.—OLD CASEMENT FASTENERS.

Our Illustrations.

PRIZE DESIGNS FOR COLOUR PRINTS FOR CHILDREN'S BOOKS.

THESE sheets are very decoratively treated, and make seasonable subjects for illustration, marked as the designs are by a recognition of fun, as well as a certain conception in the graphic representation of the subjects selected, and also for the feeling with which they are rendered. We have chosen Miss Eugenie Richards' prize drawings for this reason, and can but commend her skill and inventiveness in investing the characters of such well-worn stories with freshness and with no little power of delineation. They are intended for a child's book of Nursery Rhymes in black and white, or they would serve as the keys for colour prints to be reproduced in four or five tints. The series received a prize at the National College of Art last summer.

DETAIL OF TURRET, PASSMORE EDWARDS' POLYTECHNIC, CAMBERWELL.

THIS building is now nearing completion, and occupies an important position in the Peckham-road. We gave a reproduction of the front elevation from the architect's drawing, which was shown in the Royal Academy last summer, and it will be found in the BUILDING NEWS for May 22. To-day a detail shows the central turret, which is made of teak, the roof and lower body being sheeted with lead. The sun and moon, which are gilded, were specially modelled by Mr. Dalton, the Principal. Mr. George Wragge made the wrought-iron finial. Mr. Horsmann did the carving. The turret serves as an exhaust ventilator to the workshops, the air flues being brought together into one shaft. The builders are Messrs. F. and H. F. Higgs, of Loughborough Junction. Mr. A. E. Biggs is the clerk of the works. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

HOUSE, GARSTANG, LANCASHIRE.

THIS house is well situated, overlooking the Grisedale Fell's. The walls are of Accrington bricks with stone dressings, relieved with half-timbered work, and the roofs are tiled. The upper floors contain eight bedrooms and two dressing-rooms, with the usual offices. The internal fittings have all been specially designed by the architects, Messrs. Garlick, Sykes, and Catterall, Preston, and the work has been well carried out by the builders, Messrs. Hatch and Sons, Lancaster.

ACTON COUNTY SCHOOL FOR BOYS.

THE accompanying view and plans illustrate the above new day schools proposed to be erected by the Middlesex Education Committee on a site between High-street and Mill Hill-road, Acton. The scheme includes an assembly hall, eight class rooms, chemical and physical laboratories, an art room, headmaster's room, and a common room for the assistant masters. There is a dining hall for

a proportion of the boys in the basement with the necessary kitchen, &c. The architect of the work is Mr. A. Hessel Tiltman. The price named in the competition was £8,000. The competition drawings from which this design was chosen will be on view in the Priory School, Acton, from Dec. 28, till Jan. 2, when the Town-hall competition designs will also be open to the inspection of the public. The school designs have not yet been seen by the competitors.

FREE METHODIST CHAPEL, NUNEATON.

THE accompanying view shows the Free Methodist Chapel, Heath End, Chilvers Coton, Nuneaton; also the ground-plan. The building has recently been commenced. The builder is Mr. George Smith, of Chilvers Coton, and the contract is £1,450. The walls are faced with the best red bricks, relieved with Bath-stone dressings and roof slated with Bangor slates. Mr. T. J. Yates, of Birmingham, is the architect.

OLD CASEMENT FASTENER, SALFORD HALL, EVESHAM.

WE shall shortly give some illustrations of this interesting mansion house, of Late 15th-century date. The main existing part, which included all the principal rooms, was commenced in 1602. We shall give further particulars, with the general drawings, which Mr. Hubert Hulme, of Bedford, has sent us. To-day we publish some capital details, sketched on the spot, and forwarded by Mr. Hulme, illustrating a selection of casement fasteners and some pairs of iron hinges from doors and cupboards. They are none the less suggestive and useful because no further description is needed.

CHIPS.

A central free library for Greenwich is about to be built in Tunel-avenue at an estimated cost of £6,500. The architect is Mr. Sidney R. J. Smith, F.R.I.B.A., York Buildings, Adelphi.

The community of English Redemptorists have purchased Windhill House and St. Katharine's High School, Bishop's Stortford, with five acres of ground attached, for the purposes of a monastery. A new Roman Catholic Church is eventually to be erected in the grounds, which adjoin the parish church.

The Duke of Bedford, who is having extensive alterations made to the parish church of Woburn, Bedfordshire, at a cost of several thousand pounds, has presented a new organ and a peal of bells. One of the bells is the largest in the county, weighing 55cwt.

Mr. W. O. E. Meade-King, an inspector for the Local Government Board, has held an inquiry at the Town Hall, Decbigh, into the application of the town council for a loan of £15,000 for a new system of drainage for the town. The council propose to become first tenants of Eglwsen Farm, in order to use the whole farm for sewage irrigation purposes, sub-letting it to the present tenant. Mr. Bailey Denton, C.E., the special engineer of the council, gave evidence as to the absolutely bad and defective state of the present sewers. Alderman John Davies (a former surveyor) suggested that the town drains might be rectified, and only the Ruthin-road portion to the outfall made anew. The inspector remarked that the Local Government Board would never agree to certain methods of improvement Mr. Davies suggested.

With a view to facilitating their Irish traffic, the Great Western Railway Company are building a new harbour at Goodwick, on the south side of Cardigan Bay, and when this is completed it is the company's intention to transfer to it the whole of their plant and works at New Milford, the locomotive, engineering, passenger, goods, and cattle traffic, and the marine department. A breakwater is being carried into Fishguard Bay, and has now reached a length of 1,000ft. from the shore. The operations are being conducted by the company without the intervention of contractors.

A public memorial will be erected in the Queen's Gardens, Warrington, in commemoration of the services of the South Lancashire Regiment, Line Militia, and the Volunteers during the South African War. The memorial will take the form of a statue of the late Colonel O'Leary, as he appeared when leading the first battalion of the regiment in their charge at the storming of Pieter's Hill, which cleared the way to Ladysmith.

After a hearing lasting four days, before his Honour Judge Percy Gye, the Corporation of Newport, Isle of Wight, who are conservators of the River Medina, have been mulcted in £50 damages for the demolition of a building, the property of a barge owner named Cooper, which the Corporation alleged was on the foreshore. His Honour also granted an injunction, restraining the Corporation from further trespass.

COMPETITIONS.

ACTON.—The town-hall and municipal buildings competition drawings will be on view to the public in the Priory-road Schools, Acton (close to High-street), during next week from Dec. 28 to Jan. 2. The competitors are Messrs. Maurice B. Adams, Arthur Ardron, H. T. Hare, W. G. Hunt, Lancaster Stewart, and Rickards, C. E. Mallows, and Russell and Cooper. Mr. Hunt's scheme has been chosen on the advice of Mr. McVicar Anderson. At the same time the designs submitted for the Acton County School will be on view, including the chosen design illustrated herewith to-day, so that the collection of drawings to be shown will represent a double event of unusual interest.

UNITED METHODIST FREE CHURCH AND SCHOOLS, SEVEN KINGS, E.—The competitive designs submitted by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines, 5, Clement's Inn, Strand, W.C., have been adopted for the above church and schools, and the first portion of the building, which embraces the nave of church, including tower and temporary apse, &c., is to be proceeded with at once; also the schoolroom and two classrooms form a portion of the scheme. The estimated cost of this first portion is £3,641. The materials are to be: facings in red brick, dressings in bath stone. The tower, which is a square one, surmounted by open traceried parapet and spire, forms a prominent feature of the design.

At a meeting of the donors to the Albert Fry Memorial Fund held at University College, Tyndall's Park, Bristol, it has been decided to complete the college buildings by the erection of a memorial tower and north wing.

Alderman G. White, M.P., President of the Baptist Union has opened the new Sunday-schools erected by the Baptists in Winner-street, Paigot. The buildings have been erected at a cost of £550 on a site opposite the Baptist chapel and the existing Sunday-schools.

The county surveyor for Down has been directed to examine and report to the Law Committee of the County Council with reference to the proposed extension of the tramway system from Belfast to Holywood.

At a meeting of the Eastern District Committee of Stirling County Council, held at Falkirk on Friday, plans were submitted of the new County Council offices proposed to be erected in West Bridge-street, Falkirk. The plans, which were approved, show a handsome building to cost £8,000, including the cost of the site and the price paid for the old properties upon it.

A stained-glass window has been placed in the west end of Thornghumbald Church, near Hedon, as a memorial. The window takes the subject of John the Baptist.

The General Purposes Committee of the Woolwich Borough Council have approved of plans for a new Woolwich Arsenal railway station, and preparations will commence with the advent of the New Year.

The sanitary committee of the city council of Newcastle-on-Tyne approved on Monday of plans for the enlargement of the fever hospital at Walker, at an estimated cost of £53,000.

The Bermondsey Borough Council have acquired possession from the London County Council of a large plot of land situate by the Tower Bridge-road, which will be converted into a much-needed open space for the neighbourhood.

Lieut.-Col. W. H. Wellsted, of Hull, has awarded the Scarborough Corporation £1,950 in an arbitration as to the value of a portion of the new recreation ground, Manor-road, sought to be acquired by the North-Eastern Railway Co. for constructing new sidings on the Scarborough and Whitby line.

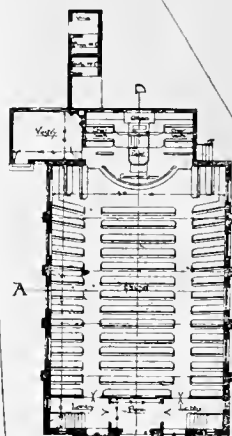
A stained-glass window has been placed in the south aisle of Brewood Church to the memory of the late Rev. Edward John Wrottesley, who was vicar of the parish from 1863 to 1901, and prebendary of Lichfield and rural dean. The window has three lights, and the subjects depicted relate to Abraham, Isaac, and Jacob. The artist is Mr. A. J. Dix, of Berners-street, W.

Mr. W. T. Paulin has presented the district of Winchmore Hill, near Enfield, with a parish hall, costing £15,000, as a memorial to the late Mrs. Paulin. The opening ceremony was performed by the Bishop of London on Saturday.

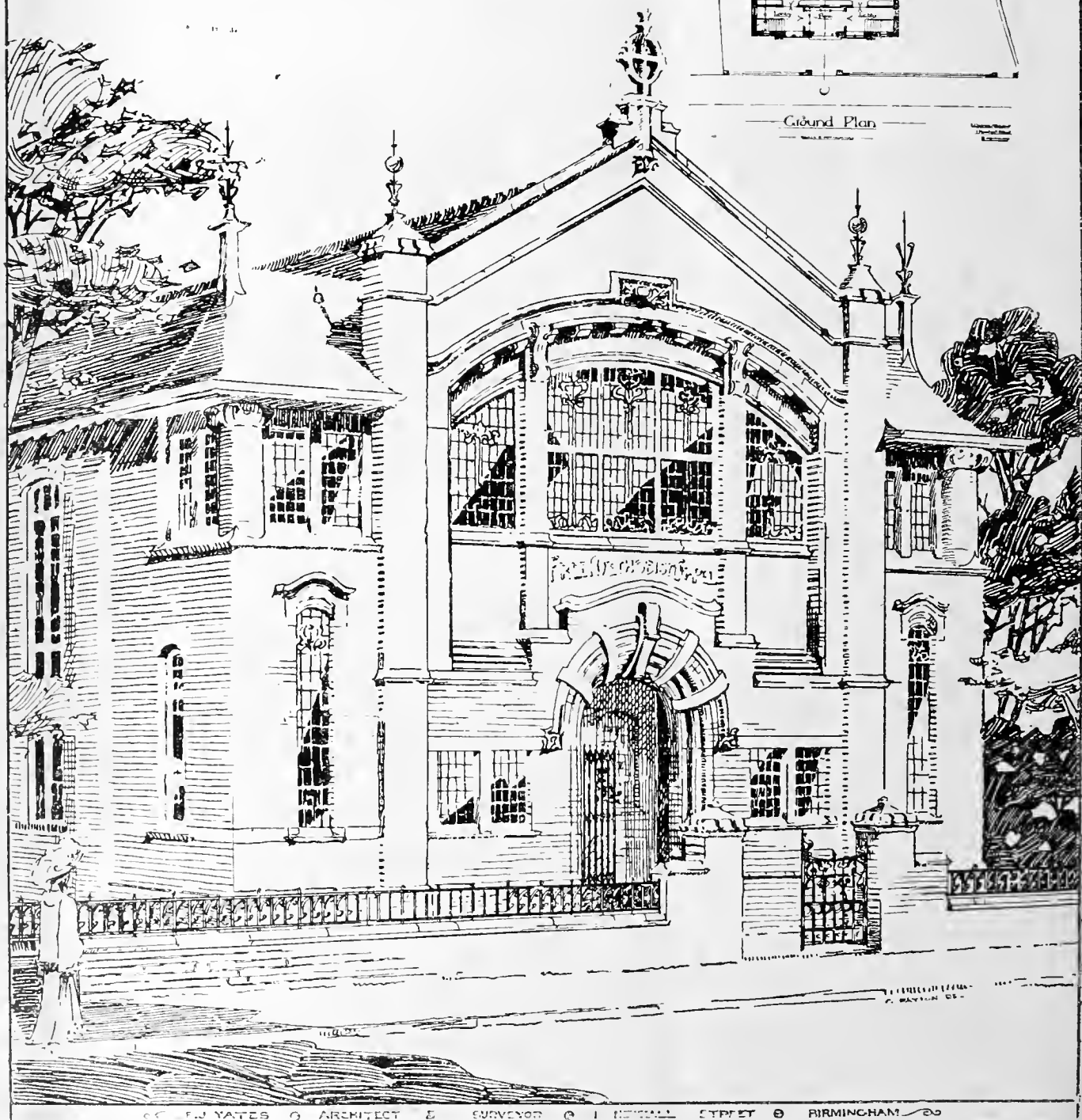
A processional cross has just been completed for Exeter Cathedral from designs of Mr. G. H. Fellows Pryne, F.R.I.B.A., of London. It is worked in repoussé silver, and enriched with ivory panels, jewels, and enamels. The design is of English Decorated character.

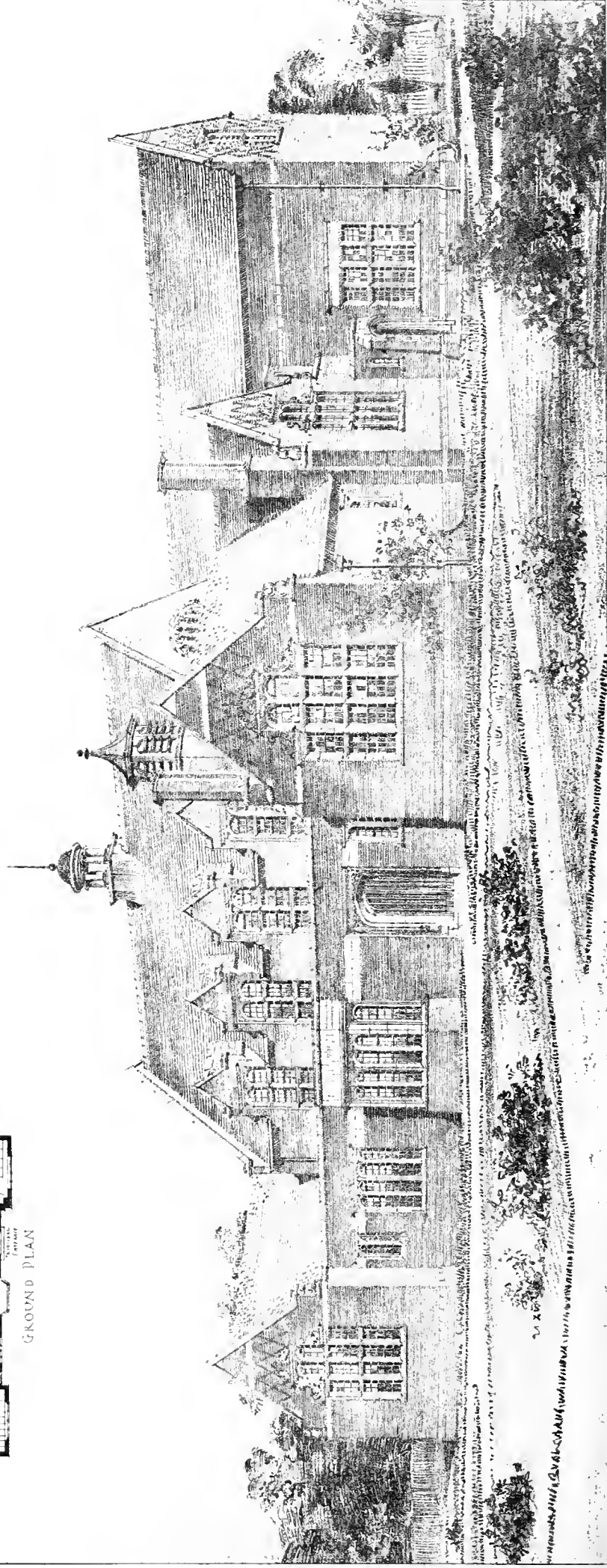
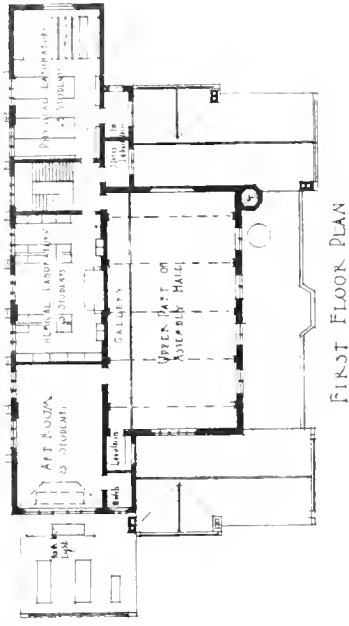
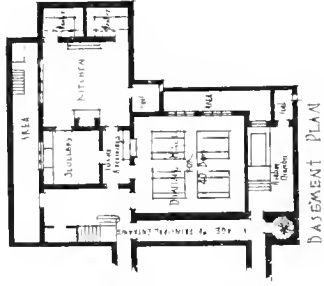
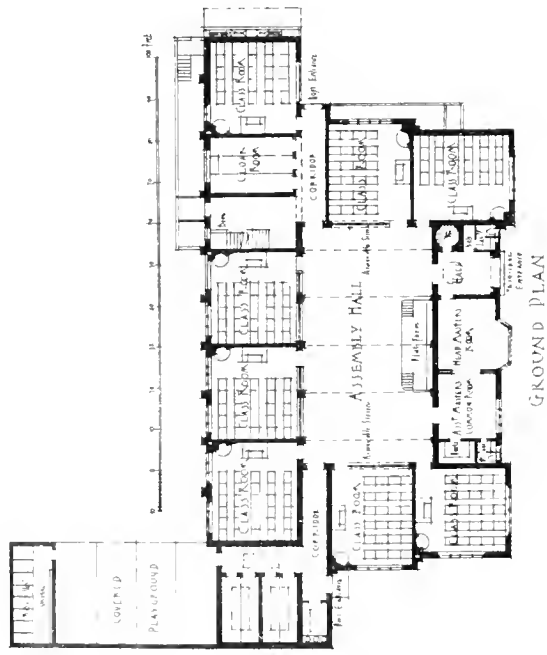
FREE METHODIST CHAPEL, HEATH END. CHILVERS COTONS.

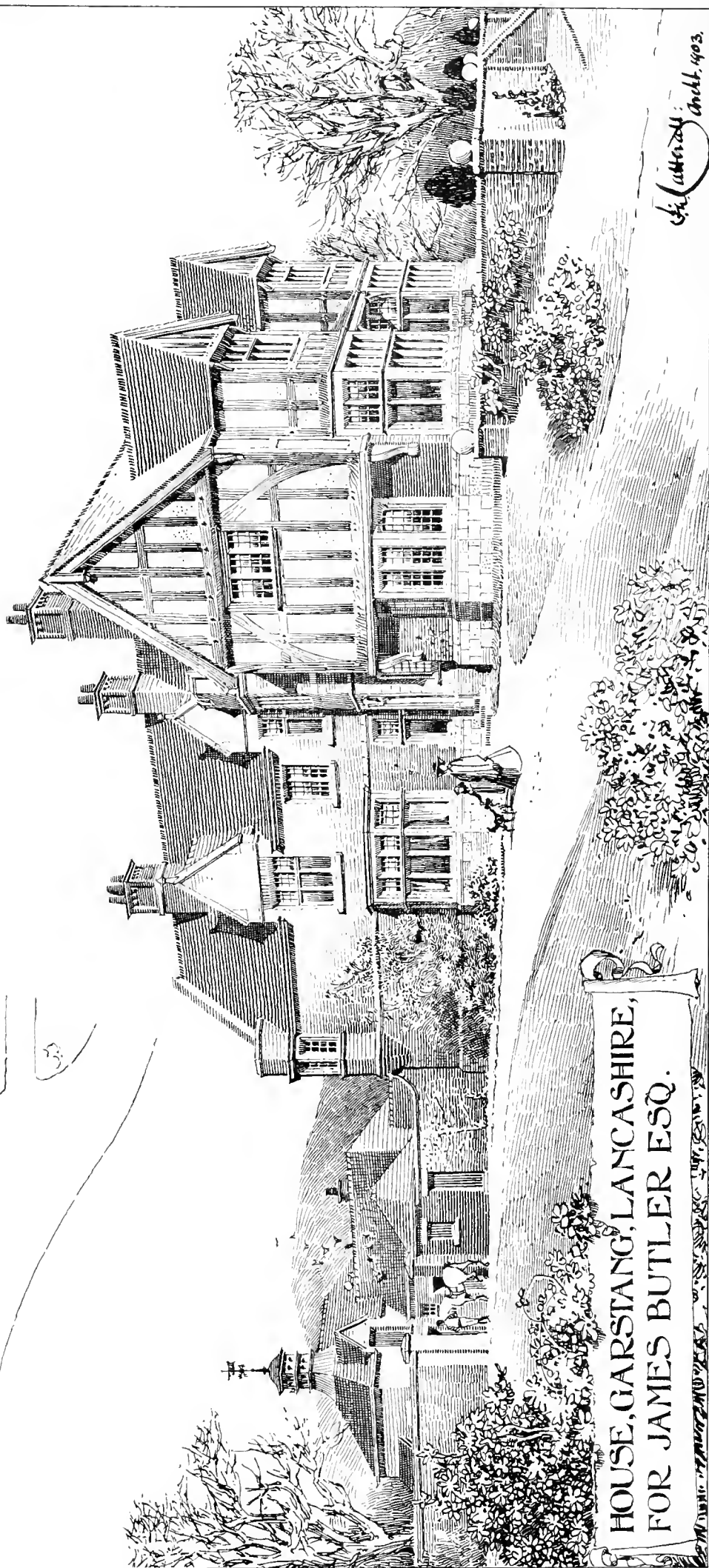
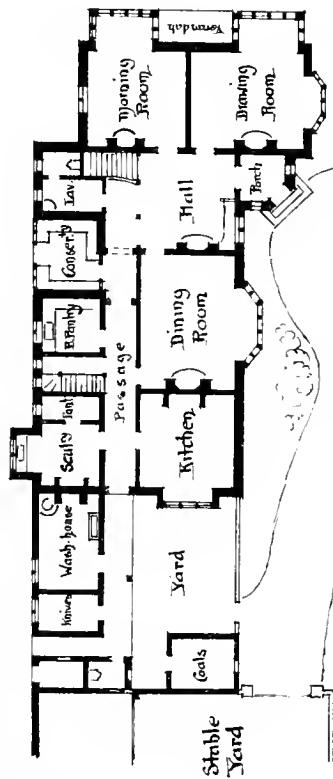
Plan



Ground Plan







HOUSE, GARSTANG, LANCASHIRE,
FOR JAMES BUTLER ESQ.

J. C. L. 1903

DETAILS of OLD CASEMENT FASTENERS

SILLS PLAIN SPRAY
INSIDE AND OUT

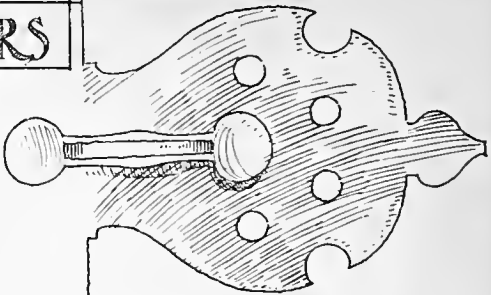


Extra spray
outside but not
breasted

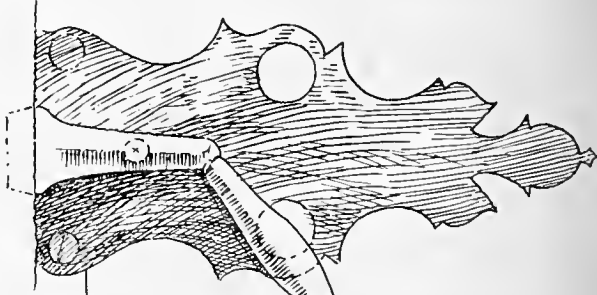
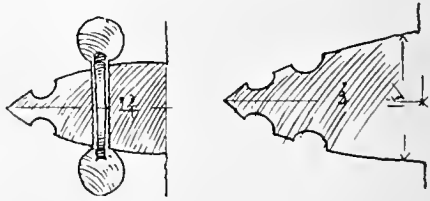
Line of iron
& wood

Plan

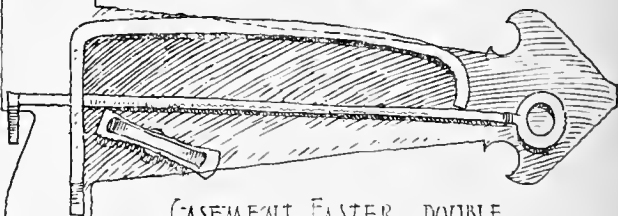
Line of iron
& wood
with
sillings
(then
sillings)



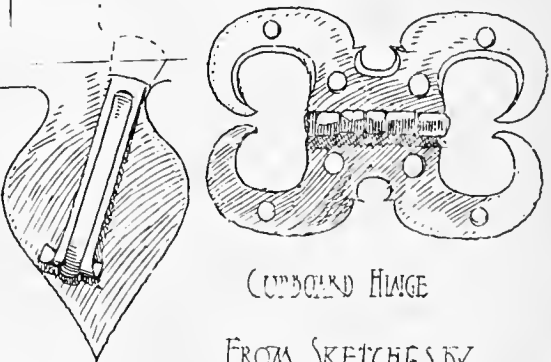
CASEMENT FASTENER



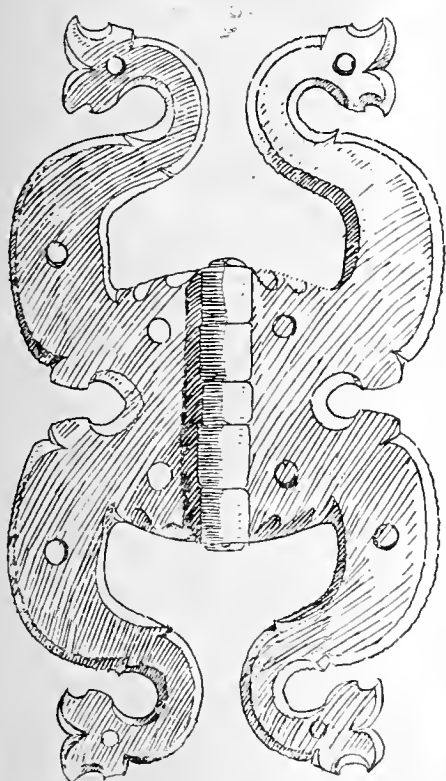
CASEMENT FASTENER



CASEMENT FASTER DOUBLE
IRON CASEMENT

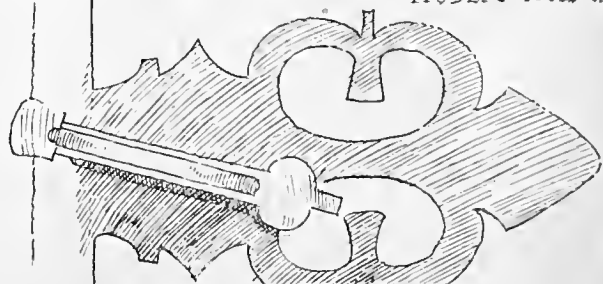


COMPOUND HINGE



IRON DOOR HINGE

FROM SKETCHES BY
HUBERT HOLME



SCALE



RESEARCHES IN CRETE.

A LECTURE was recently given under the auspices of the Sheffield Society of Architects and Surveyors, as briefly mentioned last week, in the lecture-hall of the Sheffield Literary and Philosophical Society, by Mr. Theodore Fyfe, of London, on "Recent Excavations in Knossos, in the Island of Crete." Mr. T. Winder occupied the chair. The lecturer, whose address was illustrated by lantern slides, reminded his audience of the fact that in 1900 Dr. Arthur Evans acquired full rights of digging over the central part of the Knossos hill. Since then the work of excavation has proceeded steadily for four seasons, and there seems every prospect of a fifth. A great palace has been brought to light, larger than any others of the Mycenaean age, on the mainland of Greece, belonging to a period anterior to these, but in many ways historically connected with them. The evidences of an extensive town have also been found in the vicinity of the palace. The amount of material that has been discovered is enormous. Probably no other site, either in Greece or Egypt, has yielded such a variety of small finds, many of which, as well as the architectural features of the palace, are new, and of the first interest. The term Minoan has been fitly applied by Dr. Evans to the earlier central style of Crete. The Minoan dynasty divides itself into early, middle, and late periods. The existing palace belongs to the later Minoan period, but building remains also exist of the middle period, which produced the finest pottery known in the Egean—exclusively Cretan, and undoubtedly the main source of all later ceramic styles known as "Mycenaean." Before Cretan exploration, from about 1500 to 1000 B.C. was generally accepted for the so-called "Mycenaean" age. The chief part of the existing palace at Knossos was probably all built before 1500 B.C., and stretches back beyond 2000 B.C.; the perfection of the Minoan style being probably reached at some time between these dates—about 1800 B.C. Two Egyptian finds at Knossos are evidence of intercourse between the earlier palace period and the shepherds' dynasties of Egypt. The latter palace period is more or less contemporary with the Egypt of Thothmes III. In plan the palace at Knossos is, broadly speaking, four-square, with a great central court, which, being longer than it is wide, roughly divides the plan into two portions—a western and an eastern—with connecting wings north and south. Rather more than half the palace is at the top of a hill, on a slight eminence commanding the land approaches. The remainder is on the more sheltered east slope, and it is to this steeply-sloping ground that we owe the most extraordinary architectural developments of the building. It is nearly certain that a portion, at least, of the deep part on the east slope was not less than three stories high.

In considering the plan of the palace in detail, the first thing evident is its domestic character. There is no attempt at exact regularity or symmetry. On the other hand, everything seems planned for convenience and comfort. The western portion consists mostly of basement in its present state. Here are the more public and administrative parts of the buildings, with ample magazines for stores, the judicial throne-room, and, to the west, a vast court, with the great ceremonial entrance, where the King may have sat in the gate. The other principal entrance is on the north, and evidences show that a great roadway must have existed here. The eastern portion of the palace contained the domestic quarters of the King and his family. Adjoining are the palace workshops and stores, perhaps kitchen apartments, and magazines for utensils. Here, also, must have existed a great system of halls entering off the western court. The western part of the palace is separated from the eastern by the central court, which was stone paved, but probably entirely open. The level of the central court is some 3 ft. above the existing or basement rooms of the western quarter. The palace in general dimensions is, roughly speaking, about 500 ft. square, and covers upwards of five acres. From the importance of its fresco finds, Knossos deserves the title of a second Pompeii. The evidence that it affords of a highly developed school of the arts is fully borne out by other finds—works in ivory, crystal, gold, enamelled porcelain, pottery, and fine stone. An astonishing capability of working in any material is evident. The art of painted plaster is extended to the production of full-sized reliefs, artistically superior to any hitherto known work of the period. This is all the more remarkable when we consider that this school

of the arts existed hundreds of years before the first beginnings of Greek civilisation. Another extremely important find consisted of some 1,600 clay tablets, inscribed with a highly-developed system of writing. These chiefly appear to be palace archives, in the form of accounts. The appearance of the palace in its pristine glory must have been very magnificent, taking into account the large scale and beautiful workmanship of the painted plaster, the fineness and brilliancy of the colouring material, and the effect of judiciously contrasted colours. The only things which can be compared to its frescoes out of Egypt, are some Roman paintings, certain Byzantine mosaics; and in our own time, some coloured tile work, some frescoes by Puvis de Chavannes, and some examples of the revival of coloured plaster relief, as for instance, Mr. Gerald Moira's work at the Trocadero Restaurant. But the ancient examples often show a perfection of relief which Donatello might have envied, and a permanence and brilliancy of colour which have remained quite unsurpassed.

IMPERVIOUS CONCRETE.

ONE of the subjects for discussion at the annual convention of the American Society of Civil Engineers was the question: "Is it possible to make concrete which will be impervious to water, and the best method?" Mr. Sanford E. Thompson, Assoc. M.Am.Soc.C.E., shows the possibility of making pure concrete of very thin section impervious to water by a visit to the filtration works of the East Jersey Water Company at Little Falls, N.J. A circular wall of reinforced concrete 15 in. thick at the bottom and withstanding a pressure of water of more than 40 ft. in depth without leaking, is mentioned. A tunnel between Boston and East Boston built below the harbour by the Boston Transit Commission by Mr. Howard A. Carson, M.Am.Soc.C.E., shows concrete laid in sections 30 in. in length. The arch and walls were 33 in. in thickness, and at high water the depth of arch below surface of harbour is about 70 ft. Soon after the air pressure was removed only slight percolation at the joints between the sections appeared, but were closed by forcing in neat cement grout under pressure. The essential elements for impermeability are stated as follows: An aggregate (including sand) proportioned for great density, an excess of cement, a wet mixture carefully placed, monolithic construction. The writer further remarks: "The addition of foreign substances, such as soap and alum, slaked lime or pozzuolana, has for its chief object the introduction of very finely divided matter into the pores of the concrete, and as long as the cohesion of the cement is not injured, it makes very little difference as regards the permeability, whether their action is chemical or mechanical." Clay has been suggested as a suitable material for increasing the density, as laboratory tests tend to show that a small admixture of clay increases rather than diminishes the strength of mortar. Mr. Feret has been conducting experiments to determine the effect of mixing by grinding together materials of a pozzuolanic character with cement to be used in sea-water, and has found that they improved the specimens.

A motor generating station, having an Italian terrace and garden upon the roof, is about to be built in Mayfair, W., on the plot of ground bounded by Balderton, Hart, Duke, and Brown streets. The architect is Mr. C. Stanley Peach, F.R.I.B.A.

The town council of Southampton have decided to carry out various works, including the extension of the Western Esplanade and the drainage of the Common, at a total cost of £2,500, so as to afford labour for the unemployed. The men engaged will be set to work under the direct supervision of the borough engineer.

A tender has been accepted for £5,247 to erect the Missions to Seamen Church and Institute, for sailors of all nations, at Wellington, New Zealand. The total cost, including the site, will be £7,800. On the lower floor will be the social hall, library, kitchen, &c., and on the upper floor the church, to seat about 450 sailors. The site is a corner one, near to the Supreme Court.

Mr. Henry Marc Brunel, M.Inst.C.E., of 21, Abingdon-street, Westminster, who was associated with Sir J. Wolfe Barry in the construction of the Barry Docks and the Tower and Connel Bridges, and died on October 7 last, aged sixty-one years, left estate which has been valued at £33,811 12s. 2d. gross and at £32,963 8s. 3d. net.

OBITUARY.

WE record with regret the decease of Mr. WILLIAM PAIN, F.R.I.B.A., of 60, Lincoln's Inn-fields, whose long and intimate connection with the Royal Architectural Museum was of the utmost possible service to that venerable institution, and which, under his appointment as liquidator, has only so lately been handed over to the Architectural Association. Mr. Pain for many years acted as hon. sec. of the Westminster School of Art held in Tufton-street, and without his co-operation and continued attention to the duties of the office the great success of that school would have hardly been possible. Only those who worked with Mr. Pain can ever know the amount of time and ability which he continuously rendered in the interests of both institutions. When the council of the museum determined to carry out the proposed free gift of the collection and buildings in the interest of improved architectural education, as above referred to, Mr. Pain was unanimously chosen for the position of liquidator. Owing to his long and serious illness, it is doubtful to what degree of completion the details of the transfer have actually been carried, though matters no doubt are in a very advanced stage, as the business-like methods which always distinguished Mr. Pain's conduct, we are well assured, will have left very few items in this business undetermined. Mr. Pain was a partner of the old firm of Lee Bros. and Pain, long in occupation of offices in Adelphi-terrace, Strand, and for a considerable period Messrs. Sydney Lee, F.R.I.B.A., and William Pain, F.R.I.B.A., have continued their practice in Lincoln's Inn-fields. The original firm built the well-known Italian Opera House in the Haymarket, which was pulled down to make way for His Majesty's Theatre. Messrs. Lee and Pain designed St. Katherine's Lodge, Regent's Park, and the new studios for the Royal Architectural Museum were erected from their plans for the Council. Several country houses and other buildings number among their commissions, and particularly for dealings with property and questions of compensation, light and air, and similar undertakings, Mr. Pain enjoyed a considerable reputation. He was a Fellow of the Surveyors' Institution, which body he joined in November, 1891; he had been a Fellow of the R.I.B.A. since 1875, having been elected an Associate in 1869. He was also one of the original members of the Architectural Association. His connection with Mr. Voysey's chapel may be mentioned. The funeral took place on Tuesday last, the 22nd inst., at Golder's Green Cemetery, Hampstead, where cremation was performed. Mr. Pain was sixty-six years of age, and he died at 40, Baron's Court-road, West Kensington, on Saturday last, the 19th inst.

CHIPS.

The Secretary of State for War has appointed Mr. H. F. Donaldson, M.Inst.C.E., chief mechanical engineer, to be the Chief Superintendent of Ordnance Factories, vice Colonel Sir E. Bainbridge, K.C.B.

The collection of pictures in the Maidstone Museum has recently been augmented by the purchase, through private subscription, of a water-colour painting by the late E. M. Ward, R.A. The subject is the "Battle of Aylesford between the Britons and the Saxons, A.D. 455," and the incident depicted by the artist is the end of the conflict between Horsa, the Saxon Chieftain, and Catigern, son of Vortigern, King of Kent. The painting is the original design for one of the large tapestries in Preston Hall, which was worked at the Royal Tapestry Works, Windsor.

The Scarborough Corporation have had under consideration the provision of bathing pools in the North and South Bays, similar to those which have proved so popular at Jersey. At Monday's meeting of the town council it was decided that plans of the proposed open-air sea baths should be made and submitted, and estimates prepared by the borough surveyor.

The Finance Committee of the Carlisle education authority have decided to pay the city surveyor, as their architect, £100 a year, in addition to the salary which he has already been drawing.

New diamond merchants' premises and suites of offices have been built in Ely-place, Holborn, as a block known as Andrey House. It has a superficial area of 13,824 sq. ft., and a frontage of 135 ft. in Portland stone, the style adopted by the architects (Messrs. H. H. and M. Collins, of 61, Old Broad-street) being Renaissance, freely treated. The building consists of five stories and a basement, and contains over 200 rooms. Double lifts and fireproof floors have been adopted. The builders were Messrs. Greenwood.

Building Intelligence.

BRISTOL.—The new offices of the Scottish Provident Institution, Clare-street, were opened on Monday. Messrs. Oatley and Lawrence, who are the architects, have treated the buildings in the Renaissance style. It has a base of Aberdeen granite, while the rest of the building is in Douling stone. A loaden dome, with moulded ribs and panels, which crowns the edifice, forms a distinctive feature. At the instance of the Streets Improvement Committee, the new building has been set back on the Stephen-street side, giving a much-needed additional width of about 5ft. or 6ft. The whole of the ground floor will be occupied by the Scottish Provident Institution officials, and the first and second floors and the basement will be let off as offices. The upper floors are approached by a staircase, which has a marble dado, while there are marble floors to the landings. The interior woodwork is of teak. The building contract was undertaken by Mr. R. F. Ridd, of Bristol.

EAST HAM.—The foundation-stone of a technical college to be erected in the Barking-road, East Ham, by the East Ham District Council, was laid on Friday. The new institute, which, with site and furnishing, will cost £20,000, adjoins the council's public offices, with which architecturally it will be in character. Above the basement will be rooms for building construction and kindred crafts and electrical laboratories; on the ground floor there will be an assembly room 35ft. by 30ft., with the offices of the secretary and class, reference, study, and common rooms; on the first floor will be the headmaster's rooms, demonstration apartments, and chemical laboratories. Towards the outlay £6,000 will be contributed by the Essex County Council.

EDINBURGH.—The new hotel of the Caledonian Railway Company, which occupies a prominent position at the west end of Princes-street, and has taken some years to build, was opened on Monday last. The new building has a frontage to Lothian-road of about 400ft., to Princes-street of 78ft., and to Rutland-street 176ft., and it is 110ft. high. The kitchen and servants' hall are placed in the basement next Lothian-road; they are lined throughout with white tiles. On the dark side of the corridor are arranged the wine cellars, and at the extreme end is the boiler-room. On the street floor is the entrance-hall, 38ft. by 30ft., which is panelled with mahogany. Opening off it are the grand staircase and hall, 45ft. by 40ft. The walls are lined with Pavonazzo marble, while the columns and pilasters carrying the corridor above, and rising from that to the roof, are of verde antico marble, with gilded Corinthian caps. The flooring is of black and white marble set in alternate squares. At the start there is one central stair 8ft. in width, but half-way up it divides itself right and left into two sections, which are continued to the entre-sol floor. The base of the balustrade is of dark-green marble, the centre of wrought iron heavily gilded, with the Scottish lion rampant introduced into the design, and the cope is of the light Pavonazzo marble. Opening from it on the left is a lounge, 45ft. by 22ft., and beyond is the dining-hall. It is 81ft. long, 31ft. broad, and 26ft. in height. It is in the Georgian style, and is divided into four bays corresponding to the four large windows by which it is lighted. It is panelled to a height of 11ft. in mahogany, and between each bay is a set of two fluted mahogany pilasters with Corinthian caps. The ceiling is of plaster work with floral enrichments. On the entre-sol floor are placed the reading-room and writing-room, 46ft. by 22ft., panelled in oak, the manager's office and the drawing-room, 62ft. by 26ft., decorated in the Louis Quatorze style. At the end of the corridor are the smoking-room, 40ft. by 27ft., panelled in oak, and a billiard-room panelled in mahogany, with two tables. There are five bedroom floors, on which are provided 191 bedrooms and twelve sitting-rooms for the public, and over seventy bedrooms—in the attic floor—for the staff. The first and second bedroom floors have each a corridor 31ft. in length. The architect was Mr. J. Dick Peddie, Albany Place, Edinburgh.

HUCKNALL HUTHWAITE.—The new church of All Saints, in the Common and Sutton roads, was dedicated by the Bishop of Southwell last week. The edifice is complete with the exception of the upper part of the tower. The walling stone was given by the New Hucknall Colliery Company

from their local pit, the material being obtained 400 yards below the surface, so that in more ways than one this is a colliers' church. Among the special gifts are the site, carved pulpit, choir stalls, brass eagle lectern, oak sanctuary chair; altar, oak litany desk, altar cross, professional cross, and a carved stone font. The building is entirely of the colliery stone, with Mansfield Woodhouse dressings, and the contrast is pleasing between the grey of the former and the buff tint of the latter. The style is that of the 14th century period of English Gothic, and, although seating over 500 people, the cost, including all oak furniture, chairs, &c., will not be more than about £3,600. The roof inside is covered with green stain. The builder was Mr. Clarke, of Nottingham. The carving and oakwork were carried out by Messrs. Braithwaite, of Worcester, and Messrs. Harry Hems and Sons, of Exeter. The entire church, as well as the embroideries, furniture, and fittings, was designed by Mr. C. Ford Whitecombe, A.R.I.B.A., London.

KELSO.—The new infectious diseases hospital, situated on rising ground at the Angroflat, an isolated situation to the north of the town, was formally opened on Friday by the Earl of Dalkeith, M.P. The hospital consists of two pavilions, with administrative block and laundry block. Each pavilion consists of two wards of three beds each, with duty-room for nurses in the centre, and a lavatory, &c., at the back. The wards are 36ft. in breadth, 16ft. in length, and 13ft. in height. The buildings are plain in design, but are constructed of stone. The work has been accomplished from plans prepared by Messrs. Sydney Mitchell and Wilson, architects, Edinburgh, at an outlay of about £8,000.

KIRTON HOLME.—The new Wesleyan chapel at Kirton Holme was opened and dedicated on Thursday in last week. It occupies a site adjoining the old chapel, which was erected in 1820, and which has been repaired and converted for use as a Sunday-school. The cost has been £610. The architect was Mr. W. Hinson, of Stamford, and Mr. J. R. Baker, of Moulton Chapel, was the builder. The new chapel is simple Gothic in style, with tracery heads to all the windows and doors. The dimensions of the building are 39ft. by 28ft. inside. Built on to the chapel is a minister's vestry, and outbuildings are provided. The chapel is built of red pressed bricks, relieved with Bath stone dressings, and will accommodate 166 people.

KIRKINTILLOCH.—The town council have now resolved upon the site to be acquired for the proposed town-hall and municipal buildings, for which they have in hand a sum of £4,000, collected by public subscription. The site to be purchased is in the centre of the business part of the town, with a frontage to Cowgate and Union-street. It is proposed to erect municipal buildings facing Cowgate, having departmental offices on the ground floor and a council-chamber above. Behind this building will be the halls, having access both from Cowgate and Union-street.

LANDORE, SWANSEA.—The Swansea Church extension scheme, inaugurated twenty years ago, has been further advanced by the opening and consecration of St. Paul's new church at Landore, an industrial district in the borough of Swansea, but in the parish of Llangyfelach. The church, which has cost £9,400, is designed to seat 600 adults, and consists of a nave 79ft. long by 11ft. 6in. wide; north and south aisles, each 76ft. long by 11ft. 6in. wide; chancel 36ft. 6in. long by 25ft. wide; organ chamber and clergy vestry. There are also a choir vestry, schoolroom, and classroom. The chancel is divided from nave by an arch. The choir stalls are executed in unpainted oak. The coloured marbles in the pulpit were selected to blend with the Quarella walls and Bathstone arches. Mr. E. M. Bruce Vaughan, of Cardiff, is the architect.

ROCHDALE.—The first sod has been formally cut on the site of the Church of the Good Shepherd in Eatwistle-road. The nave and aisles have been planned to accommodate 106 persons, but 471 could be seated on special occasions. There are to be two entrances, both on the north side facing Eatwistle-road. The style proposed is that of the end of the 13th century. The nave and the north and south aisles are all 60ft. long, the width of the former being 22ft. and the latter 11ft.; the total breadth of the church is 18ft., and the heights of the nave and aisles 37ft. and 25ft. respectively; the sizes of the temporary galvanised iron chancel and vestry are 22ft. by

81ft. and 12ft. by 81ft. The nave is separated from the aisles by a triple arcade, the clerestory above being 30ft. from floor, and the chancel by an archway with carved responds. The nave roof will be wagon boarded on arched moulded ribs. The west end shows a five-light tracery headed window with bell gablet above. The walls will be lined internally with pressed plastic lincoat brick, and externally with Yorkshire stone in random rock-faced level-bedded courses, the windows and dressings being of Hartham Park freestone. The floors are to be of wood-block arranged in patterns, and encaustic tiles in porch, while the roofs will be covered with mixed brown and red Brosley tiles, and the windows will be filled with tinted and bordered cathedral glass. The architect is Mr. E. H. Lingan Barker, of London and Hereford, and the contractor Mr. T. Pickles, of Luddendenfoot. The total cost will be £3,000.

WALTHAMSTOW.—The Palace Theatre will be opened on Monday next. The architects are Messrs. Wyson and Long, who have designed a building in the English Renaissance style, the imposing elevation having at either end a bold tower finished with stone and metal turrets, supporting flag standards. Under an iron and glass awning the main entrance opens into a spacious vestibule, which has a high dado of Austrian oak, with plastic decorations above, and a panelled and decorated ceiling. In front is a handsome box-office in polished walnut wood, to the right an archway, giving admittance to the stalls corridor, and on the left a broad staircase, the steps formed in mosaic and the walls of marble, leading to the balcony circle. The ground floor is divided into stalls and pit. Over the balcony, in which there are eleven rows, is a spacious gallery. The theatre being constructed on the cantilever system, an uninterrupted view of the stage is secured from every part of the house.

Among those who have accepted membership of Mr. Chamberlain's "unofficial" commission on fiscal policy are Mr. J. Howard Colls, principal of the well-known building firm of Colls and Sons, which has just been amalgamated with Trollope and Sons, of Pimlico, and Mr. S. J. Waring, jun., head of the firm of Waring and Gillow, furnisiers, of London and Liverpool.

A meeting of the council of the University of Birmingham was held on Friday, when the tenders for the erection of the superstructure of the three blocks and the great hall of the new University at Bournebrook, from plans by Messrs. Aston Webb, R.A., and E. Ingress Bell, were examined. Eighteen tenders were sent in, and that of Mr. Thomas Rowbotham, of Birmingham was accepted. The amount was not stated, but it was understood to be about a quarter of a million.

The London Traffic Commission, at their last sitting on Friday, heard evidence from Mr. T. W. Emden, past-president of the Society of Architects and Mayor of Westminster, who held that the construction of subways would solve the difficulty of the congestion of traffic in the principal thoroughfares. After hearing other evidence, the Commission adjourned till Jan. 7.

Colonel A. G. Darnford has held a Local Government inquiry at Harrogate with reference to the application for sanction to borrow £1,200 for works of sewerage and surface-water drainage in Knaresborough-road and Leeds-road.

The library committee of the Guildhall Corporation have accepted as a gift for the Guildhall Art Gallery an oil painting entitled "The Quarrymen of Parbeck," from the brush of the late Mr. H. T. Wells, R.A. The picture is the gift of Mr. Wells's two married daughters, and has been hung in the centre gallery.

Mr. W. J. Locke, secretary of the Royal Institute of British Architects, has written to Sir Lees Knowles, Bart., M.P., expressing the Council's appreciation of the fact that, with the object of preserving an old building of historic interest, he has lately purchased Turton Towers, an old hall near Bolton, Lancashire. Sir Lees Knowles has replied expressing his satisfaction at the R.I.B.A.'s approval of his action.

The sales at the Mart last week, as registered at the Estate Exchange, amounted to £60,030. For the corresponding week of last year the amount was £57,175.

An Oddfellows' Hall was opened last week in Fisher's - road, Totton, Southampton, by the Compton Lodge M.U.O. The chief room measures 58ft. by 26ft. The building has been erected by Messrs. Crook Brothers, of Eliug, from plans supplied by Mr. S. Kelway Pope, architect, of Southampton.

PROFESSIONAL AND TRADE SOCIETIES.

DUNDEE ARCHITECTS AND THE LICENSED VICTUALLERS.—A meeting of the Dundee Institute of Architecture, Science, and Art was held on Friday to consider a request made by the local Licensed Victuallers' Association for tenders for the preparation of plans for licensed houses in Dundee. This request has been made in terms of a decision by the magistrates that all license-holders should submit internal plans of their houses to the bench for preservation. Mr. A. Symon, Arbroath, presided, and referring to the advertisement which had appeared inviting tenders, said it was most unusual. Mr. P. H. Thoms said it would be undignified to answer such an advertisement, and he advised that the members should pay no attention to it. By others present objection was taken to the advertisement inasmuch as it asked for tenders from architects and others, and that the "others" might refer to apprentice joiners or masons, who might have a little skill in drawing and measuring, and that architects should take care not to allow themselves to be brought down to the level of non-professional men. Mr. Charles Ower said he had consulted a solicitor, and as a result he considered the calling of that meeting entirely illegal, because the Council of the Institute could only deal with such matters as afforded facilities for the study of the fine arts, &c. On its being explained that plans were at present being provided by an outside party to the licensed victuallers at 10s. 6d., a proposal was made that the architects should offer to do the work for 9s. 6d. This, however, did not find favour, a number of the members urging that the scale of fees existing should be adhered to, and ultimately a proposal was carried for the fixing of special fees for licensed premises plans, and for the submitting of these to the licensed victuallers for consideration.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of this association was held on Dec. 16 at 117, George-street, Mr. A. H. Crawford, F.R.I.B.A., president, in the chair. Mr. W. E. Snell, of the Garden Association, read a paper on "The Objects of the Garden City Association." Mr. Snell, in the course of his remarks, pointed out that migration to new towns would relieve the congestion in the old, and that in the garden city, which would be planned scientifically from the first, there would be cheap sites and space for gardens and farms. The garden city would give opportunities for the revival of agriculture, and would also afford healthy recreations in connection with the problems of drink and gambling. The lecture was illustrated with lantern slides.

"ELECTRIC LIGHT SUPPLY AND PRECAUTIONS AGAINST FIRE."—At the last meeting of the Insurance Society of Edinburgh, Mr. Henry R. L. Burn, of the North British and Mercantile Insurance Company, read a paper on "Electric Light Supply and Precautions against Fire." The president of the society, Mr. David Deuchar, occupied the chair. Mr. Burn traced in a practical manner an installation from the mains, through the wiring, to the lamps, radiators, and motors. Overhead wires, he said, were a source of danger, and with regard to the incandescent lamps, care must be exercised in placing them near combustible materials. In warehouses, &c., wire guards should be placed over them. He had seen them placed on the top of goods in shop windows, and it might be advantageous if in fire policies a restriction was made that they should not be put nearer the goods than 3in., especially if the goods were cotton. He emphasised the necessity of installations of electricity being carried out by first-rate firms, for if they were to believe the assessor's reports, "scamping" must be accountable for many of the fires, as they found it reported that the cause of fire in many cases was through defective insulation. In conclusion, Mr. Burn gave particulars of losses which had been incurred by fires, many of which had peculiar origins. In one case, he mentioned that owing to the wind swaying a ball lamp, the coil became frayed, and damage to the extent of £8 was done. He cited a case in which £1,100 damage had been done to a church, and stated that buildings which were not frequently tenanted should be fitted with some automatic arrangement which would give warning when necessary.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A meeting of this society was held on the 12th inst. at the society's rooms, Park-street, Leeds, when Mr. J. B. Mitchell Withers gave a lecture

on "Sir Christopher Wren: His Time and his Works." The lecturer dwelt upon the unique opportunity which the Great Fire of London presented to an architect of genius. In Evelyn's "Diary" we learned that the author submitted a plan for the improvement of London within two days of the extinction of the fire, but Wren had been before him. The scheme met with the King's approval, but, unfortunately, and to the kingdom's loss, it was never adopted. Wren had previously been appointed assistant Royal architect, and he then had occasion to report upon the old cathedral of St. Paul's, which had recently been repaired by Inigo Jones. A renewal of the fury of the flames, brought about by a big gale, resulted in the demolition of the old cathedral, and thus it was that Wren came to have the designing of the new edifice. Mr. Withers then proceeded to tell of how Sir Christopher Wren, in face of much hindrance and opposition on the part of the Commissioners of St. Paul's, succeeded in the erection of a cathedral, the pride of all Englishmen. Perhaps the only wise thing the Commissioners did in treating with Wren was when at the commencement of the undertaking they told him to submit a design for a cathedral which he thought suitable to the site and worthy of the position, and that they would then have to see about the money. After commenting upon the distinctive style of Wren, as revealed in St. Paul's, and touching upon some of the criticisms passed upon the innovations he introduced into the architectural construction of the building, the lecturer went on to describe the way in which Wren suffered at the hands of the Commissioners. One of Wren's foremost ideas was to leave the view of the high altar unobstructed from the western end of the cathedral; but this was prevented from being realised by the building of the organ at the entrance of the choir. It was also his desire to see the interior of the dome decorated with mosaics, and to this end he made elaborate inquiries as to suitable marble and qualified artists and workmen. His labours were, however, set at naught by Commissioners, who instructed Sir John Thornhill to paint the inside of the dome. Perhaps the greatest annoyance which he suffered, however, was in connection with the balustrade. The Commissioners suggested that a balustrade would be necessary, but although Wren was sternly opposed to the idea, the balustrade was designed and erected. The numerous other churches and public buildings in London which Sir Christopher Wren designed were also described by the lecturer, who was aided by numerous old engravings, prints, maps, and plans. The lecturer was accorded a hearty vote of thanks, on the motion of Mr. R. P. Oglesby, seconded by Mr. H. S. Chorley, and supported by the president (Mr. Butler Wilson).

MANCHESTER SOCIETY OF ARCHITECTS.—The fortieth annual dinner in connection with the Manchester Society of Architects took place last week at the Queen's Hotel. Mr. J. W. Beaumont, the president, was in the chair. The president proposed "The Royal Institute of British Architects." Mr. Aston Webb, R.A., President, responded. He referred, in sympathetic terms to the retirement, through ill-health, of Mr. Alfred Waterhouse, a past president of the Manchester Society. He remarked that the previous day he had received the diploma, and had entered into full membership of the Royal Academy, and though he appreciated the honour very much, yet he grieved very much to think that Mr. Waterhouse had had to resign, and that it had fallen to his (Mr. Webb's) lot to take his place. The Institute hoped to assist in the co-ordination of the educational establishment, not only in London, but throughout the country, and he asked for their hearty assistance. Mr. Alfred Darbyshire proposed "The Manchester School of Architecture." During the two years of his office, he said, he had taken an active part in the establishment of the chair of architecture in the University. For two years they struggled very hard, and had many difficulties to contend with in the accomplishment of the objects; but it was a source of satisfaction to them that they had succeeded, and in Manchester they had now got a complete institution for the education of the architect. Mr. Thomas Kay, in responding, referred to the growth of architecture in Manchester, and he thought that they need not be ashamed of their progress. Professor S. Henbest Capper also responded in a humorous and interesting speech. He said it was not the fog that attracted him to Manchester from

Canada, with its bright sun and its cheerful cold, but he came full of hope, and exceedingly grateful to the Manchester Society of Architects for the good work that it had done in the cause of architectural education. He supposed some people would think now that they had got a professor of architecture all the buildings in Manchester would be beautiful. Some students got on without professors, but they all became architects. "The Architectural Association" was proposed by Mr. John Ely, and responded to by Mr. Henry T. Hare, President of the Association. In responding to the toast of the "Allied Societies," proposed by Mr. P. S. Worthington, Mr. Butler Wilson (president of the Leeds and Yorkshire Architectural Society) said the architectural profession should no longer be a dumping-ground for those who were unfit or unwilling to properly qualify themselves for other recognised professions. Other toasts followed.

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.—The annual general meeting of the Institute of Architects of Ireland was held on Thursday, the 17th inst., at the Institute rooms, 20, Lincoln-place, Dublin, Mr. George C. Ashlin, F.R.I.B.A., president, in the chair. The hon. secretary read the annual report of council, which stated that the year had not been marked by any very great activity in the building trade. The council, however, has had under consideration several questions of great professional importance. The question of the revision of the conditions of contract now generally in use has occupied the attention of the council and the professional practice committee at frequent meetings during the year. They hoped that this very difficult question would be settled in a satisfactory and equitable way to all concerned. At an early stage in the session a deputation was received by the council from the Architectural Association of Ireland, who, feeling that their effort to improve the educational advantages open to students of architecture in Dublin by lectures, by classes, and by prizes, lacked the stimulus of a definite aim, proposed that the Institute should enact that for the future an examination should be held by the Institute in general education and professional efficiency, and that the passing of such examination should be made a condition precedent to election. The proposal, if adopted, would introduce a radical change in their constitution, and require the creation of an examining body with considerable machinery for the exercising of its functions. The council had given this question careful attention. Such a radical change would need the consent of the Royal Institute of British Architects, with which body the Institute of Ireland was allied, and it was not at all evident that they would permit them independently to hold such qualifying examinations. The attention of the council had been directed to several unsatisfactory conditions of competition issued to the profession during the year by public bodies, and had found it necessary to urge their members to refrain from taking part in these. Mr. W. Kaye Parry moved the adoption of the report, which was seconded by Mr. J. Rawson Carroll, and carried unanimously. On the motion of Mr. A. E. Murray, seconded by Mr. W. M. Mitchell, the treasurer's report was adopted. It stated that the total income of £538 14s. 8d. received during the past four years had exceeded the total expenditure of £533 9s. 5d. by £5 5s. 3d. The President declared the following nine members elected as members of council for the coming year: Sir Thomas Drew, W. M. Mitchell, W. Kaye Parry, A. E. Murray, C. A. Owen, J. P. Sheridan, Frederick Batchelor, F. G. Hicks, and J. Rawson Carroll. The annual dinner of the Institute was held in the Shelbourne Hotel in the evening. The President, Mr. Geo. C. Ashlin, occupied the chair.

THE SOCIETY OF ENGINEERS.—At the 49th annual meeting of this society, the following were elected by ballot as the council and officers for 1904:—President, Mr. David Butler Butler; vice-presidents, Messrs. Nicholas J. West, Maurice Wilson, and R. St. George Moore; ordinary members of council, Messrs. Joseph Bernays, George A. P. Cuxson, G. A. Goodwin, William H. Holtum, Henry Sherley-Price, Edward J. Silcock, Joseph W. Wilson, and George Green; honorary secretary and treasurer, Mr. George Burt; honorary auditor, Mr. Samuel Wood, F.C.A. The president announced that the following premiums had been awarded by the council for papers read during the past session:—The president's gold medal to Mr. Douglas Mackenzie for his paper on "Motor Transport for

Goods"; the Bessemer premium of books to Mr. Robert J. Thomas for his paper on "Road Maintenance and Administration"; and a Society's premium of books to Mr. Albert Gay for his paper on "Mechanical Stokers for Electricity Generating Stations."

ARCHÆOLOGICAL.

THE CAERWENT EXPLORATIONS.—A second large tessellated pavement from the Roman excavations at Caerwent, near Newport (Mon.), has been fixed in position in the museum of the Newport Free Library. It was found in what is known as House No. 7, from which the first was taken, and the two together form one of the most important discoveries of the kind yet made in Roman remains in England. Busts of the seasons and figures of animals and cupids are conspicuous objects in the pavements. The chief features of House No. 7 were a small, partially detached building, which may have been a shrine, and two rooms separated, no doubt, only by a curtain when the house was in use. It was these rooms that contained the tessellated pavements. One underlay the other, and the upper one was of later date and of inferior workmanship to the other. Drawings and tracings of both pavements were made, and both have been in sections, imbedded in cement, and put together again in the museum. In both the rooms of House No. 7 the walls were standing to a height of 3ft. above the floor level, and the plaster on them was nearly intact. It was, therefore, possible to recover to a considerable extent the colour and design of wall decoration.

CHIPS.

The War Office has agreed to purchase from the Duke of Buccleuch, at a price to be fixed by arbitration, 25,000 acres of land to be added to the Scottish military camp near Hawick.

Messrs. Hughes and Lancaster, of Westminster, have just obtained the contract for the complete drainage of Oporto on the separate system. The town is situated on the steep northern bank of the Douro, which allows of its being drained mostly by gravitation. The contractors have undertaken to complete the main works in the town within four years from the date of the signature of the contract.

The Provincial Government of the Province of Zealand, at Middelburg, will receive tenders for the supply of two pairs of iron gates and eight sewer-valves in the lock eastward of Sas van Gent; the upper metal construction of a drawbridge and of a fixed bridge in the road from Sas van Gent to Westdorpe, with the appertaining work. Estimated value of the work, 184,500fl. (£15,375) in all.

A peal of six new bells is being placed in St. John's Church, Roughton, Mossley. The bells are the gift of the late Miss Bradbury, who left £900 for the purpose and for a stained-glass window.

The waterworks undertaken at Wentwood by the town council of Newport, Mon., have thus far involved an outlay of £374,801. The works have advanced so much that it has been decided to sell the greater part of the plant by auction next month.

A new church is about to be built on the site of 201, Balham High-road, S.W., from plans by Mr. J. L. Gibson.

The Johannesburg Town Council have just recently passed plans for 103 buildings, the estimated cost of which is £74,714.

The new tower which has just been added to St. Margaret's Church, Arbroath, N.B., was formally dedicated last week.

The long-standing dispute between the Ballachulish Slate Quarrying Company and their workmen has at last been settled, on terms satisfactory to the men. The quarry has been closed for about a year, but the men found employment elsewhere.

The Local Government Board, after reconsidering the application of the Gloucester City Council for sanction to borrow £2,000 for the purpose of de-fraying their share of the cost of reconstructing the Sudbrook Culvert, have given the required consent.

The new church institute and schools at Crook, Co. Durham, have been formally opened by Sir David Dale. They comprise a large hall, with two ante-rooms, and face the south side of the Market Place. The cost has been £11,600.

There has recently been erected in the Southampton Cemetery a memorial to the late Mr. T. G. Rooper, H.M. Inspector of Schools. It consists of a massive cross resting on a rustic base, and is a modification of the celebrated ancient cross at St. Colum's Major, in Cornwall. The memorial, which is constructed of unpolished grey granite, has been designed and erected by Messrs. Garret and Haysom, of Southampton.

Engineering Notes.

MERSEY DOCK DEVELOPMENTS.—At the Mersey Docks and Harbour Board's final meeting for this year, Mr. Robert Gladstone, the chairman, reviewed the board's work, pointing out that great progress had been made in the construction of new and the extension of existing docks and widening of dock entrances. These schemes were necessary owing to the increased trade of the port and the greater size of steamers. One of the graving docks now in course of construction, 800ft. long by 100ft. wide, would have the largest dock gates in the world. A river wall and graving-docks were in course of construction at Tranmere, on the Birkenhead side of the river, embracing an area of 62 acres.

ROWNHAM, BRISTOL.—Messrs. Lysaght and Sons, Ltd., recently secured the contract for the steelwork of the new railway and highway bridge over the Avon above Rownham, and that important undertaking will soon be completed. The masonry and woodwork of the piers have been already carried out, and a great deal of work has been done on both sides of the river in the formation of approaches. The supposition, made years ago when the enterprise was launched was that the expenditure would be about £36,000. The bridge is one with two platforms, the lower for the Great Western Railway and the upper for the general public, and the arrangement was that the company should pay half the cost. That agreement found expression in the Act of Parliament in figures under which the G.W.R. were rendered liable for £18,000 only. It now appears that the cost will approximate £70,000.

A Bill has been deposited in the Private Bill Office of the House of Commons, which seeks the sanction of Parliament to the construction of a railway under the Thames between North and South Woolwich. The length of the proposed railway will be a little more than three-quarters of a mile, commencing in North Woolwich, near Francis-street, and terminating in South Woolwich, near Beresford-street. It is proposed to work the railway by electricity from a generating station on the north side of the river.

At Chirk, Denbighshire, on Saturday, the new parish-hall, erected as a Coronation and Victorian memorial, was formally opened. The building comprises an assembly-hall to accommodate 600 persons, together with retiring-rooms. To the front are library, reading-rooms, secretary's office, and other accommodation. On the first floor are council chambers and technical classrooms. The building, which cost £5,000, is in the Jacobean style.

Colonel A. G. Durnford, R.E., Local Government Board inspector, held an inquiry at Doncaster, on Friday, as to an application by the corporation to borrow £9,920 for the electricity undertakings.

New co-operative premises in Edward-street, Winsford, were opened last week. The erection of the new shop was carried out by Mr. W. Carter, the architect and clerk of works being Mr. Thos. Dutton. The new premises have a frontage of 40ft., and at one end is a flour-room, 16ft. by 8ft., fitted with patent dust and vermin-proof flour-bins and shoots. On the story above there is a warehouse, 51ft. 6in. by 15ft. 6in.

The borough magistrates of Falkirk made a final inspection on Friday of the Grand Theatre and Opera House, which has been erected in Vicar-street, and at a subsequent meeting licensed it as a place of public entertainment. The theatre is seated for 2,000 people.

At Christ Church, Albany-street, St. Pancras, on Friday, a memorial window and tablet to the late Bishop of St. Alban's, Dr. J. W. Festing, subscribed for by members of the congregation, were formally dedicated by the Bishop of Colchester.

At the last meeting of the town council of Southampton the town clerk reported the receipt of the formal sanction of the Local Government Board to the borrowing of £12,500 in reference to the completion of the Housing of the Working Classes scheme.

Mr. Edward Smith (chairman of the Fire Brigade Committee of the London County Council) opened on Saturday afternoon a new fire station in Mitcham-lane, Streatham. The tender of Messrs. Potter Brothers, amounting to £10,000, was accepted for this station, and the buildings have been put up under the supervision of Mr. W. E. Riley, the superintending architect to the London County Council. The station has cost, including £2,000 for the freehold, £12,000. There are twelve sets of quarters, and accommodation for eleven men and a station officer, besides stables containing four stalls.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, Clement's House, Clement's Inn Passage, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

RECEIVED.—A. and L.—R. K. E.—Relln.—H. P. A.

Correspondence.

THE R.I.B.A. AND REGISTRATION.

To the Editor of the BUILDING NEWS.

SIR,—Will you kindly allow me, through your columns, to draw the particular attention of such of your readers as are Fellows or Associates of the R.I.B.A. to the notices of motion (of which copies are inclosed), given by myself and others, for the business meeting to be held on Monday, Jan. 4? The matters upon which a direct vote is sought are of such vital importance that I need hardly apologise for asking that every member who can possibly do so should attend that evening and record his vote either one way or the other.—I am, &c., G. A. T. MIDDLETON.

19, Craven-street, Strand, W.C., Dec. 18.

NOTICES given for the R.I.B.A. Business Meeting, to be held on Jan. 4, 1904, by G. A. T. Middleton and others:—

1. To move: That this Institute is in favour of the general principle of the compulsory Examination and Registration of Architects.

2. To move: That a committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a special general meeting before the opening of Parliament.

3. To nominate this committee.

LEGAL INTELLIGENCE.

LONDON WATER ARBITRATION.—At Monday's sitting, the Court made its award in the case of the Grand Junction Water Company, whose claim was £4,863,195, while the Water Board had offered £1,500,000. The arbitrators awarded £3,319,500, to be increased to £3,552,500 if their ruling of the sinking fund is held to be wrong. The case for the Water Board in reply to the West Middlesex Company was then concluded, and the Court gave its decision in this case also, awarding to the company, which claimed £4,305,245, a sum of £3,524,000. The Court adjourned to January 18.

WHAT IS A WAREHOUSE?—**GREEN V. BRITTEN AND GILSON.**—In the Court of Appeal judgment has been given by the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy in an appeal from a decision by Judge Addison, K.C., sitting at the Southwark County-court, under the Workmen's Compensation Act, 1897. The applicant for compensation was a workman in the employment of the respondents, Messrs. Britten and Gilson, oil and colour merchants and dealers in glass. The respondents had a shop in Union-street, Southwark, and on the opposite side of a narrow street they occupied two railway arches in connection with their business. These two arches communicated with each other, and there was an underground passage leading from the shop to one of the arches, which was used as a lead and glazing shop. The other arch was used for storing cases of heavy glass. The glass was stored there and polished. The respondents' business was conducted in the shop, and the glass from the plate glass arch was either supplied to the shop for customers giving their orders there or was taken away direct from the arch by the respondents' carts when the orders were given to the respondents' travellers. Customers did not go into the arch, where there was no buying or selling. The shop was supplied from the arch. The main part of the business was of a wholesale character, the retail part being a small part of it. The applicant was on the day of the accident employed in loading and unloading cases of glass in the plate arch when three cases fell upon and injured him. The applicant took proceedings to have compensation assessed under the Workmen's Compensation Act, 1897, contending that the arch was a "warehouse," and therefore a "factory," within the meaning of section 7 of the Act. The County-court Judge held that the plate arch was used, and only used, as a storeroom, and that it was not a "warehouse" within the meaning of the Act. He accordingly dismissed the application for compensation. The applicant appealed. Mr. Blackwell and Mr. O'Connor, for the workman, contended that this arch was a "warehouse" within the meaning of section 7, subsection 2, of the Workmen's Compensation Act, 1897, and therefore a "factory" within the Act. Whether a place was or was not a "warehouse" was a mixed question of law and fact—"*Hoddinott v. Newton, Chambers, and Co.*" (1901), and in this case the County-court Judge misdirected himself. There was no definition of "warehouse" in the Act, and therefore the word must be construed in its ordinary and popular signification—"*Haddock v. Humphrey*" (1900). They referred to "*Wilmott v. Paton*" (1902), "*Burr v. Whiteley*," and "*Watson v. Cotton*." Mr. Shakespeare, for the respondents, contended that the arch was not a "warehouse" within the Act. The arch was merely used as ancillary to the business carried on in the shop. The case was covered by "*Burr v. Whiteley*." In order to make a place a "warehouse" it must be used as a warehouse for storing goods. The case of "*Colvius v. Anderson*," in the Court of Session, was directly in point. The Court allowed the appeal. The Master of the Rolls said that the question was whether the building in which the accident admittedly occurred was a "warehouse" within the meaning of the Workmen's Compensation Act, 1897. So far as the wholesale trade was concerned, the store fulfilled all the purposes of a warehouse. The respondents had also a retail business, which, however, formed but an insignificant part of the whole business. The County-court Judge came to the conclusion that this was not a warehouse. It was exceedingly difficult, by reason of the course which the decisions had taken, to mark out the line which separated that which was a warehouse from that which was not. The decisions had gone a long way. They had excluded certain lines of definition of what was and what was not a warehouse. In a recent case of "*Hunt v. Grantham Co-operative Society*" (1902), a line of demarcation was laid down by Judge Wightman Wood—namely, that where the store was merely ancillary to a retail shop it was not a warehouse, as neither shops nor shopkeepers were brought within the Act. This Court adopted that principle in "*Burr v. Whiteley*," and laid it down that large receptacles used for storing goods which were kept for the purpose of sale in a retail shop were not warehouses within the meaning of the Act. Now they came to a case which seemed to combine both attributes. A wholesale business was carried on, while at the same time a small retail

business was carried on in the shop. Looking at the whole of the facts, this arch was used almost entirely for the purposes of the wholesale business, and in his (the Master of the Rolls's) opinion the learned County-court Judge misdirected himself in saying that, if the store was ancillary to the business carried on in the shop, it was not a warehouse within the meaning of the above decisions. If this store was ancillary to a wholesale business, it was a warehouse. If it was ancillary to a retail business, it was not a warehouse. It seemed to him that the County-court Judge had misdirected himself in point of law. The County-court Judge was too strict in the application of the principle laid down in the case of a storeroom being ancillary to a retail business. In the present case the storeroom was ancillary to the wholesale trade, and was therefore a "warehouse." The appeal must therefore be allowed. Lord Justice Mathew was of the same opinion. Lord Justice Cozens-Hardy said that he had some doubt in this case, but it was not strong enough to make him dissent from the conclusion arrived at by the Master of the Rolls and Lord Justice Mathew.

PRIVATE STREETS WORKS APPEAL.—**WAKEFIELD CORPORATION V. COOKE AND OTHERS.**—In the House of Lords, the judgment has been given by Lord Chancellor, Lords Macnaghten, Shand, Davey, Robertson, and Lindley in the case of "*Wakefield Corporation v. Cooke and Others*." An appeal from an order of the Court of Appeal (Lord Justice Vaughan Williams, Stirling, and Mathew) dated February 3, 1903, which reversed an order of the King's Bench Division (Lord Alverstone, Chief Justice, and Justices Darling and Channell) dated December 16, 1901. The respondents were owners of premises fronting Sludge-lane. By the Wakefield Corporation Act, 1887, Part IV., sections 27 to 45 inclusive, the appellants obtained power to deal with private street works within the city. The provisions of the said Act are (*mutatis mutandis*) identical with the provisions of the public Act intitled the Private Street Works Act, 1892. The appellants by resolution determined to exercise in relation to part of Sludge-lane the powers conferred upon them by the Act of 1887, and by a further resolution of March 9, 1897, they approved a specification of the private street works required to be carried out therein, together with the plans and sections of such works, the estimate of the probable expenses thereof, and the provisional apportionment of the estimated expenses among the premises liable to be charged therewith, which had been prepared by the city surveyor in accordance with the instructions given to him. The resolution was duly published, and was served on the owners and occupiers of Sludge-lane, most of whom were respondents. In accordance with the provisions of section 30 of the Act, most of the owners and occupiers served upon the appellants notices objecting to the proposals of the appellants, on the ground "that Sludge-lane is a highway repairable by the inhabitants of the city of Wakefield at large." The respondents' objections were heard by three justices for the city on Jan. 6, 1893, and the justices made an order whereby they determined that the objection "that Sludge-lane is a highway repairable by the inhabitants of the city of Wakefield at large" was a good and valid objection. This order had not been appealed against, and was still in full force and effect. In November, 1900, the appellants by resolution determined to exercise the powers conferred upon them by the Act of 1887 in relation to the same part of Sludge-lane which was the subject of their previous resolution of March 9, 1897, but with an additional length of 80 yards in a straight line, and continuous therewith. This addition was throughout treated as immaterial. By a further resolution of February 12, 1901, the appellants approved a specification, plans, and sections of such works. The appellants published this resolution and served notices thereof on the owners of the premises pursuant to the provisions of section 29 subsections (2) and (3) of the Act of 1887. In accordance with the provisions of section 30 of the Act, most of the persons liable to be charged under the resolutions of February 12, 1901, served upon the appellants notices objecting to the proposals of the appellants on the ground "that Sludge-lane was a highway repairable by the inhabitants of the city of Wakefield at large," the respondents the County Council for the West Riding adding to their objection that the same had been previously so found by the justices for the city of Wakefield at a Court of summary jurisdiction held at Wakefield on January 6, 1893. The objections were heard by four justices for the city on July 25, 1901, who determined that the objection "that Sludge-lane is a highway repairable by the inhabitants of the city of Wakefield at large" was the same objection as was decided on January 6, 1893, and the justices declined to hear any evidence or to go into the merits of the objections. A special case was stated for the opinion of the King's Bench Division, and their lordships were of opinion that the reasoning of the Court of Appeal in the case of "*The Queen v. Hutchings*" applied to this case, and that, therefore, the objections taken on behalf of the objectors that there had been a previous determination that

the street in question was a highway repairable by the inhabitants of the city at large was no bar to the proceedings taken in this case. The Court therefore ordered that the judgment of the justices of July 25, 1901, should be reversed, and the matter remitted to the justices to proceed with the hearing. The Court of Appeal, however, held that the finding of the justices on January 6, 1893, was conclusive evidence in any Court into which it came of the matters therein stated, and if not in form called a judgment *in rem* was at all events in all its essentials a judgment *in rem*, and that the decision in the case of "*The Queen v. Hutchings*" did not require the justices sitting on July 25, 1901, to inquire again into the merits, and the Court therefore allowed the appeal of the respondents and reversed the order of the King's Bench Division. The Lord Chancellor, in moving that the appeal should be dismissed, said that the case was doubtless one of local importance; but the matter became clear if one compared the 150th section of the Public Health Act, 1875, with the provisions of the local Act. By the Public Health Act all streets were within the jurisdiction of the urban authority. Then by section 150 the urban authority could require any street—the distinction of public and private streets being made for convenience—to be properly sewered, levelled, paved, metalled, flagged, or channelled, and also lighted. If the owners of the private street did not comply with the orders of the urban authority, the latter could do the work themselves and enforce payment of the cost of executing the work. The case of "*The Queen v. Hutchings*," which was relied upon by the appellants—with which his Lordship respectfully concurred—had no application to the present appeal. In that case the magistrates exceeded their jurisdiction, because they dismissed an application for the recovery from the owner of the expenses of sewerage of a street on the ground that the street was a public highway repairable by the inhabitants at large. But the machinery of the statute involved here was different. By section 30 of the Wakefield Corporation Act, 1887, the proposals of the corporation could be objected to by the owners on the ground among others "that a street or part of a street is (in whole or in part) a highway repairable by the inhabitants at large." This question was, under the Act of 1887, one for the justices, and was submitted to them for their determination, and was finally settled in January, 1893, and could not now be reopened. In effect that decision was a judgment *in rem* on the status of the street. He was disposed to agree with Lord Justice Vaughan Williams that this procedure was introduced by reason of difficulties arising under the Public Health Act, 1875. Lord Macnaghten and Lord Shand concurred. Lord Davey dissented from the view of the case taken by the Lord Chief Justice. In his opinion the primary, and not, as the Lord Chief Justice held, merely the incidental, duty of the Court of summary jurisdiction was to hear and determine objections. This showed the distinction between the present case and "*Reg. v. Hutchings*," in which Lord Selborne and his colleagues in the Court of Appeal held that the first order of the justices was beyond their jurisdiction, and did not constitute *res judicata* in respect of the later application. He agreed with the Lord Chancellor that there was here in effect, if not strictly, a *res judicata*. Lord Robertson said that he had at first shared the doubts expressed below by Lord Justice Stirling, but had been convinced by the arguments of Mr. Danckwerts. Lord Lindley concurred.

NEGLECT TO MAKE-UP ROADS.—**ATTORNEY-GENERAL V. S. WHEATLEY AND CO.**—Mr. Justice Joyce, sitting in the Chancery Division, has heard a motion to commit two directors of the defendant company to prison for not having forthwith made up Hartington-road, Chiswick, to the satisfaction of the district surveyor, pursuant to an undertaking contained in an order made in the above-mentioned action, dated July 29, 1903. The action was brought by the Attorney-General at the relation of the plaintiffs, who were the owners of houses with frontages on the road in question. The defendant company were the owners of a piece of land at the end of the road. The Hartington-road was a public road, but not repairable by the inhabitants at large. The defendant company had opened a sand-pit on their land, and used traction engines and trucks upon the road for drawing the sand. The plaintiffs alleged that this use of the road destroyed the road and was a public nuisance, and they claimed an injunction and damages. At the hearing of the action a compromise was agreed to and, upon the defendants' undertaking forthwith to make up the road to the satisfaction of the district surveyor between certain points, and upon certain other undertakings, all further proceedings in the action, except for the purpose of carrying the order into effect, were stayed. The undertaking not having been complied with, the plaintiffs moved to commit the directors for breach of the undertaking. The notice of motion was afterwards amended by asking in the alternative for an order upon the company to make up the road within three months. The defendants, the directors, alleged that they had agreed to the compromise in the belief that the cost of making up

the road would not exceed £800, of which the company was to contribute £500, whereas the cost of making it up upon the lines required by the district surveyor would be about £1,500. They further said that the company was quite unable to find the money to comply with the requirements of the district surveyor. It was contended on their behalf that no order ought to be made against them personally. The plaintiffs, on the other hand, contended that the undertaking which was given by the directors was equivalent to an order upon them, and that under the Rules of Court, order 42, rule 31, they were liable to be attached for disobedience to it. That rule provides that "any judgment or order against a Corporate body wilfully disobeyed may, by leave of the Court or a judge, be enforced by sequestration against the corporation's property or by attachment against the directors or other officers thereof, or by writ or sequestration against their property." Mr. Justice Joyce made an order upon the company to do the work within three months as asked in the amended notice of motion. With reference to the application against the directors, he said that, having regard to all the circumstances of the case, and that this was an undertaking, and not an order, he could not make any order against them under the rule in question. As against them, therefore, he refused the application, without costs; but this would be without prejudice to any application that might be made against the directors in the event of the company's not complying with this order.

ANTI-SIPHONAGE TRAPS FOR INDUSTRIAL DWELLINGS.—**METROPOLITAN INDUSTRIAL DWELLINGS COMPANY V. LONO.**—In the King's Bench judgment has been delivered by the Lord Chief Justice, Mr. Justice Lawrence, and Mr. Justice Kennedy in this action, a case stated on the application of the defendant company by Mr. Chapman, police magistrate, at the Southwark Police-court, in the matter of 33 summonses taken out on behalf of the Southwark Borough Council against the appellants, the owners of Ponsonby Buildings. The magistrate said the defendants were the owners of Ponsonby Buildings Industrial Dwellings, erected before the confirmation of the drainage by-laws of 1901, made under section 202 of the Metropolitan Management Act, 1855; and in December, 1902, owing to the substitution of an iron pipe or drain for one of ordinary Doulton ware, they found it necessary to put new traps and pans connected with 33 water-closets in their buildings as the old traps and pans were broken during the progress of the work, but there was no change in the upright soil-pipe. They were then informed by the local authority that these new traps must be fitted with anti-siphonage pipes, in accordance with by-law 17 of the London County Council drainage by-laws, because, by by-law 21, the by-laws were made applicable to new work in old buildings as far as practicable. The defendants refused to comply, on the ground that these by-laws were not applicable, and were unreasonable; and it was now further contended that they were *ultra vires*. The local authority thereupon took out 33 summonses for non-compliance in the case of each of the 33 closets, in order that these questions might be settled in a court of law. The defendants, in order to support their contention as to the unreasonableness of the by-laws, called evidence that the soil pipes were of such dimensions—namely, 5in. in diameter—that the evils of siphonage, to prevent which these by-laws had been made, would not possibly occur, and that the expense which must be entailed by compliance with the by-law was so great as to make the application impracticable. Mr. Dodd, for the local authority, contended that he had no right to consider any questions except the application of the by-law and its practicability. He had with some hesitation come to the conclusion that this contention was right. The by-laws admitted of no exception for the case of new buildings which contained a system of drainage where there was no probability of siphonage, and he did not think he was at liberty to create such an exception in the case of old buildings, to which the by-laws applied. If this were possible a dispute might be raised on each case, and the by-laws rendered practically valueless. He set aside, therefore, the question of whether the by-law was necessary, or even useful in this particular case. Then, as to its practicability, he did not think there was any evidence that compliance with the by-law was not practicable. The figures given for the probable expenses went far beyond this case, and he did not consider they ought to affect his judgment. The words "so far as practicable," in his opinion, were intended for cases where large structural alterations or demolition of buildings would be necessitated by the application of the by-law, which was not the case here. He thought, therefore, that the application was practicable. He also considered that the work done involved the application of the by-laws to these traps. Mr. Dauckwerts, K.C., contended that the work must involve a reconstruction of the rooms in which the water-closets were placed, or, at any rate, of the system of water-closets; but he thought the words used in by-law 21 were intentionally wider than that, and specifically applied to every

trap or apparatus connected with a pipe or drain. Two other questions remained: Were these by-laws under section 202 *ultra vires*, and were they unreasonable? On the first he was distinctly of opinion that they were not *ultra vires*. As to the second question, if he felt justified in pronouncing an opinion as to the reasonableness of the by-law as applied to this building, he should have great hesitation in deciding the case. He did not, however, feel so justified; but, generally, he could not doubt that it had been made by the London County Council and approved by the Local Government Board for good cause. In these circumstances he could not hold that they were unreasonable, though he regretted there was no proviso for the case where it was proved that there was practically no danger of siphonage. There were other dangers, no doubt, connected with pipes of too large a diameter, and it might be that the authorities felt that the only safe way of dealing with so difficult and dangerous a matter was by such a hard-and-fast rule, and so long as it existed the local authority was bound to enforce it. He had no alternative but to convict the defendants; and there would be a fine of 40s. and £10 10s. costs on each of the others. In reply to an application on behalf of the defendants, Mr. Cecil Chapman agreed to state a case. The Lord Chief Justice, in giving judgment, said that these by-laws ought to be supported, except in a very clear case of their being unreasonable, or of their not covering what was complained of, particularly when they were sanitary by-laws, for it was important that the local authority should be supported. For that reason he rejected the implied argument that, because there was an existing system of ventilation, the magistrate should have taken that into consideration. The magistrate found in favour of the appellants that there was very little chance of siphonage or regurgitation, but that was *nil ad rem*. The only thing he had to consider was whether there was a breach of the by-laws as properly construed. His Lordship considered that there was power to make these by-laws under section 202 of the Act of 1855, and these general powers ought to be construed liberally. These by-laws were in no sense *ultra vires*, and that issue tended to divert the mind from the judicial consideration of their proper construction. It was only in strong circumstances that a by-law ought to be held to be unreasonable, and these by-laws were neither unreasonable nor *ultra vires*. All they had to do with was their construction, and it must be remembered that when they were dealing with penalties the proceeding was *quasi-legislative*, and there should be at least as much clearness and certainty as in statutes and provisional orders imposing penalties. A person who had to make up his mind what his duties and liabilities would be was entitled to be told in reasonably plain language what he was to do, particularly in the case of existing buildings. When by-laws were applied to old buildings, it was not putting too great a burden on the local authority to say that they must state in reasonably plain language what were the burdens put on owners. In this case, in the course of altering the drains some of the pans and traps were injured. There was no change of the upright soil-pipe. There was nothing done in the way of reconstruction except where the traps and pans were broken. The respondent contended that the by-law was to apply in a case where really there was nothing but repair of the pans and traps, and there was no reconstruction or intention to reconstruct. If a local authority desired to say that when one repaired any part of an existing closet or repaired the closet itself one was bound to remodel the ventilation, they were bound to say so in plain terms. The question was whether they had said so here. If by-law 17 had in terms said that in the case of old houses when a broken trap was repaired a certain system of ventilation must be put in, that might be a perfectly good by-law. He saw no reason why it should not. By-law 21 applied these by-laws to old buildings, and must be read most strongly against the person who was doing the work. Was it right to say that the work contemplated by that by-law must be the construction of a water-closet under by-law 17? That was going too far. But if the local authority meant to say that putting in a new trap was the construction of a water-closet, or that the doing of repairs which had been rendered necessary by some part of the closet being broken when some other work was being done, brought by-law 17 into operation, they ought to have said so in plain words. By-law 21 did not inform a person that if he repaired a trap or pan he was constructing a water-closet. Notwithstanding the difficulties arising in this case, he had come to the conclusion that the by-law was not sufficient to make that which was done the constructing of a water-closet within by-law 17, and these penalties ought not to be enforced. He did not agree that by-law 21 was *ultra vires*, but the local authority had not brought within it what was done in this case. The other learned Judges delivered judgment to the same effect, and the appeal was accordingly allowed.

A SARDINIA-STREET ARBITRATION.—The claim for £30,000 compensation by Pendarves Trustees

against the London County Council for the freehold of the premises used by the Metropolitan Electric Supply Company in Sardinia-street, Lincoln's Inn-fields, required for the new thoroughfare—Kingsway—has been settled before Mr. Under-Sheriff Burchell at the Sheriff's Court, Red Lion-square, by consent, at £24,750.

BANKS' FIREPROOF CONSTRUCTION SYNDICATE, LIMITED.—At the Board of Trade offices, Carey-street, on Wednesday, meetings of the creditors and contributors of this company were held under an order for compulsory liquidation. Mr. A. S. Cully, Assistant Official Receiver, presided. The statement of affairs showed liabilities amounting to £11,781, of which £9,990 was expected to rank, whilst the assets, valued at £1,700, were covered by debenture bonds. The company was stated to have been registered in May, 1891, for the purpose of constructing fireproof floors, and appeared to have incurred a loss of £11,000 through underestimating the cost of carrying out certain contracts and £3,000 through bad debts. Both meetings left the liquidation in the hands of the Official Receiver.

REOPENING AWARDS UNDER THE WORKMEN'S COMPENSATION ACT.—**SHARMAN V. HOLLIDAY AND GREENWOOD, LTD.**—In the Court of Appeal, on Friday, judgment was delivered by the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy in this appeal from a decision of the Judge of the Lambeth County-court in proceedings under the Workmen's Compensation Act, 1897. The workman in this case met with an accident on August 16, 1901, while in the service of the employers, who were builders and contractors. The accident resulted in his being totally incapacitated for work, and on Dec. 3 a memorandum of agreement was filed in the Lambeth County-court under which the employers were to make the workman a weekly payment of 15s. during incapacity. On Dec. 11, 1902, the employers filed a request for a review of the weekly payment, on the ground that the workman was not suffering from any result of the accident, but was able to work and earn full wages. The arbitration came on for hearing on Jan. 21, 1903, when the County-court Judge reduced the payment to 1d. per week. On April 24 the workman filed a request for a further review, asking that the weekly payment might be increased to 15s. The second arbitration came on for hearing on June 23. It was contended on the part of the employers that the matter was *res judicata*. The County-court Judge asked on what new facts the applicant relied showing that his earning powers had been diminished since the hearing of the former application on Jan. 21, and after hearing such fresh evidence, his Honour held that, as he had decided on Jan. 21 that the earning powers were not at that time diminished, and as the present application was again on the ground of total incapacity, the matter was *res judicata*; and also that there were no facts alleged showing any alteration in the circumstances of the case since the hearing on Jan. 21. The applicant appealed. The Court allowed the appeal, and remitted the case to the County-court Judge. The Master of the Rolls said that in this case the County-court Judge, on an application by the employers under clause 12 of the first schedule to the Workmen's Compensation Act, made an award by which he declined to allow the injured workman a weekly payment of more than 1d. By adopting that course he kept seisin of the case. When the matter came before him again on an application by the workman to have the weekly payment reviewed, he found that no change had taken place in the condition of the man, and he refused to review the weekly payment, on the authority of "*Crossfield and Sons v. Tanian*." The question was whether the first decision of the County-court Judge governed the position of the parties for all time. He doubted whether it was right to apply the doctrine of estoppel to such a matter of opinion as the question whether a man was incapacitated for work. An opinion based on expert evidence might be displaced by subsequent experience. He (the Master of the Rolls) thought that was not a matter in which there ought to be an estoppel. The case of "*Crossfield and Sons v. Tanian*" was not a case of an estoppel on a matter of opinion. The fact that the workman had been repeatedly refused employment pointed to evidence of attempts on his part to get work and of his inability to do so. He came to the conclusion that there was a change in the circumstances which justified the County-court Judge in reviewing his previous decision. Lords Justices Mathew and Cozens-Hardy concurred.

The town of Lyndhurst is being sewered for the New Forest Rural District Council, and the works are approaching completion. Messrs. Coombes and Bennett, of Southampton, were the engineers, and Mr. Woods is the contractor.

At a meeting of the Newcastle-on-Tyne Board of Guardians, on Friday, it was agreed to accept the tender of Mr. Weatheritt, builder, Worswick-street, Newcastle (£16,127 5s. 11d.) for the rearrangement of the children's block and the provision of a visitors' waiting-room and nurses' bedrooms at the workhouse.

Our Office Table.

The joint committee of architects and surveyors who have taken in hand the reform of the law relating to Ancient Lights seem to have been badly advised as to its draughtsmanship, for the measure as published is defective in many particulars. No radical abolition of the whole complicated machinery of the accrual of easements to light in nineteen years and a day is proposed, but the reforms are restricted to two points—the substitution of a written notice of obstruction from the occupier threatened with the imposition of an easement for the present unsightly and costly hoarding, and the appointment of a tribunal of appeal composed of experts to decide all disputes of this class. In both cases, however, the promoters have blundered. There is no provision for enforcing penalties for neglect on the part of the occupier to forward such notices of obstruction to his landlord, and the tribunal's decisions in cases where the damage it assessed at over £500, are deprived of finality by the provision of an appeal to the High Court. These and other objections to the crudely framed Bill were brought out during the discussion on the subject at the last meeting of the Society of Architects, and although that organisation might have been expected to look with favour on any measure which proposes to transfer a large proportion of the fees payable in ancient light cases from the pockets of lawyers to architects, it was unanimously agreed to oppose the measure in Parliament, and to employ counsel for the purpose. Judging from the contemptuous neglect shown by the present Parliament to all measures for social reform, it will be no difficult matter to block the Bill at every turn.

The recent Chippendale Furniture case has recalled some stories about old and modern dealers' doings in passing off more or less questionable replicas of genuine examples. Among these tales few can compare with an exceedingly astute piece of business which lately took place in connection with the sale of an "exceptionally fine suite of Chippendale." The attention of a nobleman, known for his taste in these matters, was directed to the furniture in question, which he saw and purchased for £500, and had sent off to his country mansion. Shortly after, a shooting party brought down a friend who was a connoisseur to see the aforesaid purchase. He came to the speedy conclusion that several of the pieces were only very clever copies, and that though some of the furniture was genuine it was not all real Chippendale. The earl consequently reported this opinion to the dealer who had sold the goods, and in reply was told to return the suite if it did not give satisfaction, as there would be no difficulty in disposing of it at the price already paid. A cheque would be forwarded for the amount by return on receipt of the furniture. The nobleman returned the goods, saying: "I have this day sent you the furniture as arranged, and shall thank you for the cheque forthwith." The dealer sent the money and put himself into communication with an American gentleman of large means, saying: "You will see by the inclosed letter from Earl So-and-so that a very exceptional suite of fine Chippendale has come into my possession from Dry-as-Dust Castle," &c. Having thus got a pedigree for the suite, its sale at more than double the nobleman's figure was at once obtained, and no doubt whatever now remains as to its authenticity.

SIXTEEN tramway schemes have been finally sanctioned and adopted by the London County Council, and will be promoted next session. Of these the following five will not, if sanctioned by Parliament, involve any street widenings: 1, Hampstead-road to Oxford-street, via Tottenham Court-road; 2, Westminster Bridge-road to Strand, via Embankment; 3, Waterloo-road extension; 4, Grove Vale, Camberwell, to Stuart-road, Peckham; and 5, Trafalgar-road, Greenwich, to East India Dock-road, via Blackwall Tunnel. Eleven schemes are proposed which involve street widenings to be carried out with the co-operation of the borough councils concerned. These are: 6, Marble Arch to Cricklewood, via Edgware-road; 7, Clapham Common (south side) to East Hill, Wandsworth; 8, Streatham terminus to county boundary; 9, Wellhall-road from South-Eastern Railway Company's bridge to High-street, Eltham; 10, Lordship-lane to Dartmouth-road, Forest Hill; 11, Lewisham High-road to Park-road, Forest Hill; 12, New Cross-

road to High-street, Lewisham; 13, High-street, Lewisham, to Lee Green; 14, Deptford to Herbert Hospital, Woolwich; 15, Beresford-square, Woolwich, to High-street, Plumstead; and 16, High-street, Plumstead, to county boundary near Abbey-road, via Basildon-road.

THE interim report of the British Electric Traction Company states that during the present year over fifty route miles of new or reconstructed tramways or light railways have been opened for traffic by electric traction on the overhead system. Considerable progress is being made by the County Council of Middlesex, and by the Metropolitan Company, in the construction of the lines and works, and about twenty miles of lines will be opened for traffic by electricity on the overhead system early next summer. During the past Session the Company has obtained an Act of Parliament authorising the reconstruction for working by electric traction of the existing Brighton and Shoreham Tramways and extensions of the lines to Worthing, and the Company has also obtained an Act of Parliament authorising the construction of further tramways in the neighbourhood of Croydon, forming extensions of the existing Croydon Electric Tramways, thus completing a network of tramways of about thirty route miles.

AN interesting find of bronze relics has been made on the Lulworth Castle Estate, in Dorset. On one of the farms near West Lulworth there is a great drift of flints on the chalk, and the flints have been used for road metal. In the course of excavations the labourers came upon a number of bronze relics. Through the kindness of Miss Weld they have been sent to the Dorset County Museum on temporary loan. The most important object is a bronze sword, 24½ in. long, and, though broken, it is in a fine state of preservation. Other relics are a socket celt, a gold or heavily gilt bronze finger ring, a socket gouge, a hilt of a sword, an object which is believed to be one of the fittings of a car (an opinion confirmed by Mr. C. H. Read, of the British Museum), supposed harness fittings, and a bronze crook.

THE fourth annual report of the Board of Trade on their proceedings under the Conciliation (Trade Disputes) Act, 1896, has just been issued as a Blue Book. It covers a period of two years—viz., from July 1, 1901, to the end of June, 1903. During the two years covered by this report 41 cases have been dealt with, in 21 of which a cessation of work was involved. In the preceding two years there were 46 cases. The total number of cases in the period of nearly seven years which has elapsed since the passing of the Act amounts to 154. In the period dealt with in this report there were 29 cases of application from both parties, four from employers only, and eight from workpeople only. Of the 41 cases under the Conciliation Act during the last two years 16 arose in the building trades. During the whole period since the passing of the Act, 56 cases, or more than a third of the total, have been in the building trades, no other group of occupations approaching this one in the number of cases furnished. During the past two years the number of cases settled under the Act has been 29, in 13 of which a stoppage of work took place. Of the 29 cases, 27 were settled by arbitrators or umpires appointed by the Board of Trade, and two by conciliators. Four other cases were settled by the parties during negotiations by the Board of Trade, and in seven cases either the application was declined by the Board of Trade or such action as was taken did not result in a settlement. The remaining case was pending at the date of the report. Of the two cases settled by conciliators, one affected practically the whole of the building trades at Bristol. Among the 27 cases settled by arbitration were a dispute affecting carpenters and joiners at Bradford, in which 315 men struck against a proposed reduction of wages, and which was referred to arbitration after a stoppage of more than fifteen months; and another stoppage affecting builders' labourers in the Potteries and Newcastle district, about 1,000 men having their wages changed by the award. One of the four cases settled by the parties during negotiations by the Board of Trade was the dispute affecting joiners at Barrow-in-Furness.

On Christmas Day, Mr. Harry Hems is giving at the Luckie Horseshoe studios in Exeter his thirty-fifth annual feast to the poor old folk of that city who have been worsted in the battle of life, without distinction of creed or party. After dinner the Bishop and Mayor of Exeter have

promised to put in an appearance, and address a few cheery words of greeting to the assembled guests. Last year, it will be recollected, Mr. Hems was disappointed in his chef at the last moment, and the festival had to be transferred to Plymouth; this time early arrangements have been made, and the feast will once more take place in the Ever Faithful city.

CHIPS.

The movement having for its object perpetuation of "the memory of Ipswich martyrs, who for their constancy to the Protestant faith suffered death by burning," was consummated on Wednesday week by the unveiling by Dr. Wace, Dean of Caterbury, of a memorial which has been erected in Christchurch Park in that town, on the slope just above the mansion, at a point where the main roadway branches towards the Bolton-lane exit. The memorial consists of a column of stone raised on a square pedestal, and terminating in a canopied finial, the style adopted being Decorated Gothic. The shaft is of polished Aberdeen granite, and the base and canopy of Ketton stone. The memorial was designed by Mr. H. T. Edwards, and executed by the Art Memorial Company, West Norwood.

The altar tomb which has been erected this week over the grave of the late Dean Stephens in Winchester Cathedral churchyard was dedicated on Tuesday, the anniversary of the Dean's death. There has also been a memorial brass affixed in the floor of the choir of the cathedral, close to Rufus's tomb.

A meeting of the Devizes Town Council was held on Friday, when a scheme was adopted (prepared by Mr. C. E. Ponting, F.S.A.) for the decoration of the interior of the town-hall, the cost being estimated at £370.

The Carnegie free library at Littleborough, Lancs, has just been opened. The architects were Messrs. S. Duncan and Butterworth, of Rochdale.

The extension of the tramway lines of the Glasgow Corporation, measuring two miles of double track, from Union-place, near Rutherglen, to Cambuslang, has now been completed, and has been opened for traffic. The through route is from Cambuslang to Partick, via Hope-street, Bothwell-street, and St. Vincent-street.

On Friday a marble bust of the late Dr. John Manley (1827-1902), which has been placed in the central reading-room, High-street, Wednesbury, as a memorial of the services rendered to the town by him, was unveiled. The cost of the bust, which is the work of Mr. Hopkins, of West Bromwich School of Art, has been defrayed by subscriptions.

The Northern Stone Dressing Co., Ltd., has just been registered with a capital of £10,000 in £1 shares, to acquire the business and assets of the Northern Stone Dressing Co., now carried on at Byker, Newcastle-on-Tyne. The subscribers are J. J. Lish, Craiglees, Heaton-road North, Newcastle, architect; Mrs. N. B. Lish, same address; J. R. Lish, same address, quarry owner; Miss C. H. R. Lish, same address; B. B. Lish, same address; K. H. Lish, same address; Miss F. M. Lish, same address; T. T. Dunn, 21, Brook-street, Whitley Bay, stone works manager; W. M. Pybus, Post Office Chambers, Newcastle, solicitor. No initial public issues.

The new "George White" school on Silver-road, Norwich, was opened by the Mayor on Thursday in last week. The building was the last that was erected by the late School Board. Mr. C. J. Brown, of Norwich, was the architect, and Mr. T. Gill, of Rupert-street, Norwich, was the contractor. The school cost £13,800, exclusive of the site, or £13 5s. per head.

A magnificent mosaic floor has been exposed at Trier during the recent work on the canal near the Basilica. It dates from the latter half of the third century A.D.

The London County Council propose to begin early in 1904 the conversion of the Brixton and Streatham cable tramway into an electrical conduit system at a cost of £107,300.

The subject for the monthly students' competition of the Manchester Society of Architects for December has been a village school for 150 children. The prize has been awarded to Mr. T. Harold Hill.

Mr. F. H. Stevens read a paper on the "Specific Performance of Contracts" at a meeting of the Institute of Estate and Home Agents at Pagani's Restaurant, Great Portland-street, on Wednesday week, Mr. E. Pennington presiding.

New science laboratories have just been added to Ipswich School, from designs by Messrs. Bishopp and Cautley, architects, of Ipswich. The buildings form a block situated in the chapel yard, and they are detached from the rest of the premises, save for a corridor communicating with the older part of the school. The builder was Mr. W. T. Death, of Ipswich. The cost has been £1,200.

